THE Journal

OF THE AMERICAN DENTAL ASSOCIATION

JANUARY

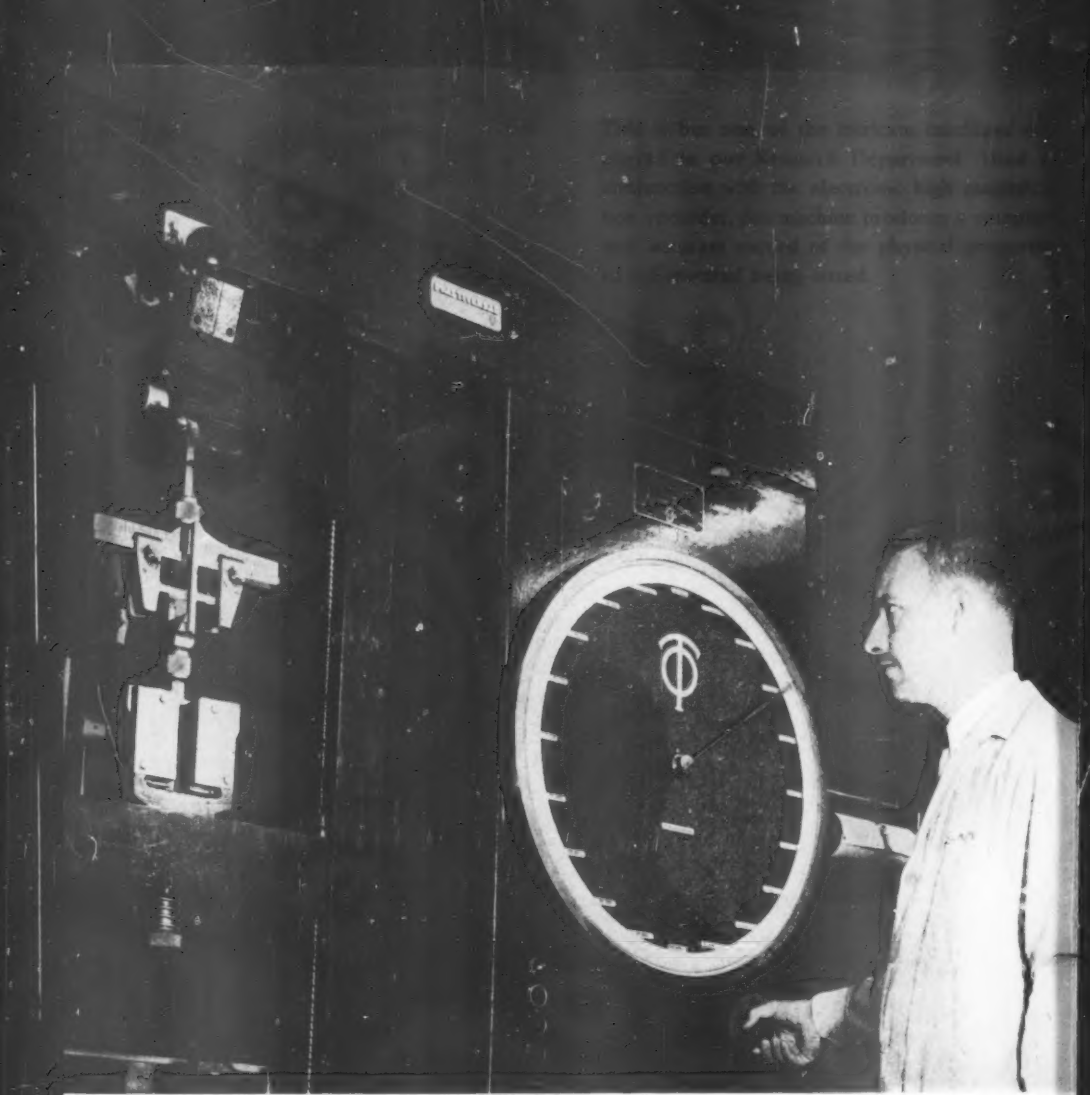
1952

CONTENTS

Management of injured teeth—Wilbur 1
Correction of abnormal pterygomandibular fold—Godwin 9
Overcoming blocks in dentistry for children—Lamons 15
A treatment for bruxism—Ingersoll 22
Stomatitis and gingivitis in the adolescent—Kerr 27
Mobile auxiliary dental unit for hospitals—Hutt 34
Training for dental health program—Sebelius 38
Dental status of veterans and nonveterans—Walters 40
Electromyography and dental research—Pruzansky 49
Ankylosed deciduous molars—Vorhies 68
Armed Forces Medical Policy Council—Rose 73
Reports of councils 76
Provisions of income tax law—Revenaugh 83
Editorials 87
News of dentistry 90
Book reviews 112
Current literature 115
Cases and comments 120
Deaths 123
Announcements 130

VOLUME 44

NUMBER 1



"DENTSPLY" STRIVES TO EARN AND HOLD YOUR CONFIDENCE

For many years the name "Trubyte" has been closely identified with the best in artificial teeth and with many of the new techniques, materials and instruments for prosthetic work. This pioneering spirit is still the first and daily interest of those dentists, scientists and technicians who constitute the large Research Department of the Dentists' Supply Company. Trubyte Dentron Teeth, their most recent accomplishment, is certainly a noteworthy improvement in plastic teeth.

TRUBYTE *Dentron*® TEETH

Captain Lewis L. Millett's Medal of Honor

While personally leading his Infantry company in an attack on a strongly held position near Soam-Ni, Korea, Captain Millett noted that his 1st Platoon was pinned down by heavy enemy fire. Ordering another platoon to the rescue, he led a fixed bayonet

assault up the fire-swept hill. In the traditional Infantry spirit, Captain Millett charged into the enemy positions, bayoneting two of his foes, then shouting encouragement to his troops, continued throwing grenades, and clubbing and bayoneting the enemy. Inspired by his example, the attacking unit routed the enemy, who fled in wild disorder.

"It's an uphill struggle," says Captain Millett, "to build a working peace. Unfortunately, the only argument aggressors respect is *strength*. Fortunately we've learned this lesson in time.

"*You* can help build our strength—the defense-line of peace—by buying United States Defense Bonds. Every Bond is a declaration to the world—especially to would-be aggressors—that we aim to insure peace.

"I think a secure peace is worth working for. If you think so, too, buy United States Defense Bonds now."

★ ★ ★

Remember that when you're buying bonds for national defense, you're also building a personal reserve of cash savings. Remember, too, that if you don't save *regularly*, you generally don't save at all. Money you take home usually is money spent. So sign up today in the Payroll Savings Plan where you work, or the Bond-A-Month Plan where you bank. For your country's security, and your own, buy United States Defense Bonds now!

Peace is for the strong... Buy U. S. Defense Bonds now!

The U. S. Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America.

The Journal of the American Dental Association, Vol. 44, No. 1. Published by the American Dental Association, 222 E. Superior St., Chicago 11, Ill. Yearly subscription $7.00 for U. S. and possessions; $8.00 for foreign countries. Single copy seventy-five cents. Entered as second-class matter, December 31, 1947, at the postoffice at Chicago, Ill., under the act of March 3, 1879. Published monthly. Copyright 1952 by the American Dental Association. The Journal of the American Dental Association is indexed in the Index to Dental Literature and, in part, in the Quarterly Cumulative Index Medicus, Biological Abstracts and Chemical Abstracts.

A Choice of Three

POSTURE COMFORT CHAIRS

MODEL 1050

MODEL 1050A

MODEL 135

Send for FREE Booklet

The Model 1050 Posture Comfort Chair is a standard model used by the majority of dentists. Model 1050-A is the same as Model 1050 except that the saddle seat affords greater leg room comfort for the tall slender dentist — Supplied only on special order. Model 135 is the same as Model 1050 without the lateral body support. *Take your choice* — Select the model that suits you best. Now you can operate in the seated position with complete mobility . . . confidence and comfort. Order from your dealer today or write:

CHILDS MANUFACTURING COMPANY
Macon, Georgia

FOR A SUCCESSFUL DENTAL PRACTICE

Visualize yourself as the above harmonizers. You are trained in technique, but what about sound practice management?

You need both for success. You need technique PLUS sound, ethical business administration if you are to avoid discord.

For close practice harmony, learn about PBP — about sound practice management backed by many years of successful counsel for thousands of dentists.

LEARN HOW PBP PRACTICE HARMONY *PAYS AT LEAST* 5 WAYS

- MORE PRODUCTION
- MORE INCOME
- CONTROL OF ACCOUNTS
- IMPROVED GOOD WILL
- SIMPLIFIED MANAGEMENT

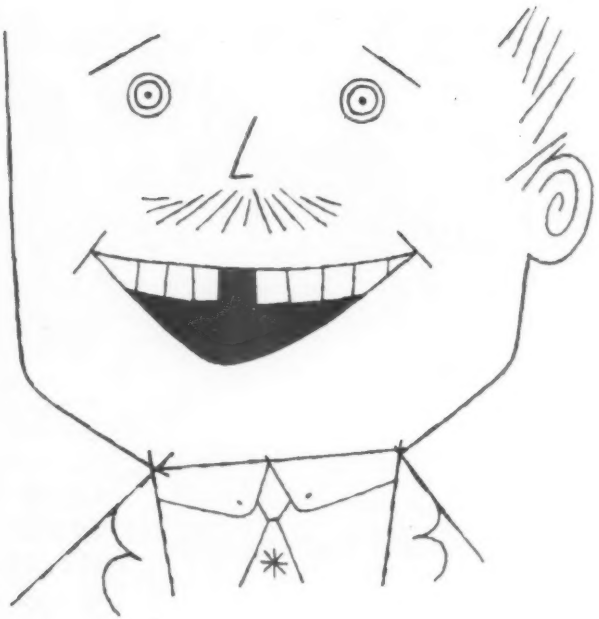
Without obligation, tell me about PBP practice harmony.

Dr. .....

Street .....

City ..... Zone ..... State .....

MAIL TO **PROFESSIONAL BUDGET PLAN** 303 E. WILSON ST. MADISON 3, WIS.



didn't feel a thing!

. . . Nor, in most cases, will he feel a thing afterward if you anesthetize with Abbott Procaine Dental Cartridges.

These ready-to-use cartridges assure your patient effective local anesthesia with only minimal postoperative pain, and no untoward or painful tissue irritation. While you, Doctor, are assured of solutions that are sterile, isotonic and adjusted to a pH that provides maximum stability.

Each cartridge is plainly labeled, and will fit all standard syringes. Your usual source of supply has Abbott Procaine Cartridges in all four commonly-used concentrations. Abbott

abbott's

PROCAINE HYDROCHLORIDE

2% with Epinephrine 1:60,000, 1:50,000, 1:30,000

4% with Epinephrine 1:50,000

extra strength of **Luxene 44 dentures** permits less bulky construction!

Because Luxene 44, the Vinylite* plastic denture material, is 2 to 3 times stronger and tougher than acrylic plastic, Luxene 44 dentures can be made less bulky, thinner, lighter.

There are laboratories in your community specially trained and equipped to give you these *superior* Luxene 44 dentures. Ask us for full information today . . . a postcard will do

118 EAST 25TH ST., NEW YORK 10. N. Y. **LUXENE, INC.**

*Registered Trade Mark

Thank You, Doctor!

For your enthusiastic reception of

The Journal of Prosthetic Dentistry

The professional press notices, the reviews of the early issues, and the subscriptions placed spontaneously and eagerly in such large numbers, all have been very heartening.

Since the founding of the Journal only ten months ago, 9,000 of you have enrolled as subscribers, and many more are enrolling every day. We are printing 10,000 copies of the January issue, confident that you will require all of them. These figures indicate, we believe, that the reception you accorded this new journal is unmatched in the whole field of professional publishing.

This warm reception extended far beyond our own borders, for we have received very kind press notices from dental centers in distant countries, and subscriptions from almost 1,000 dentists in other countries.

For all of this we are truly grateful. We pledge our very best efforts to strive to continue to merit your generous and growing support. The constantly growing opportunities for service in prosthetics are such that we believe we will be called upon to provide this important journal—the most outstanding in its field, in the world—to many more thousands of you during this year and the years immediately ahead.

The Journal will remain a bi-monthly during 1952. It will present approximately ninety papers, comprising about 1,800 pages of text. The subscription rates will be unchanged: $9.00 for domestic and Pan-American service, and $9.50 for other foreign service.

Again, we thank you very much!

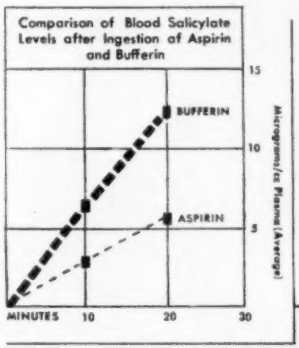
The C. V. Mosby Company, ***Publishers***

3207 Washington Blvd. St. Louis 3, Missouri, U.S.A.

Faster Pain Relief with BUFFERIN

1 ACTS TWICE AS FAST AS ASPIRIN

The antacids in Bufferin speed its pain-relieving ingredients through the stomach and into the blood stream. Actual chemical determinations show that within ten minutes after Bufferin is ingested blood salicylate levels are higher than those attained by aspirin in twice this time.[1]



2 DOES NOT UPSET THE STOMACH

Bufferin's antacid ingredients protect the stomach against aspirin irritation. This has been clinically demonstrated on hundreds of patients.

in usual doses

In a series of 238 cases, 22 had a history of gastric distress due to aspirin but only one reported any distress after taking 2 Bufferin tablets (equivalent to 10 grains of aspirin).[3]

in large doses

In a recent study group, 1006 patients received, over a 24 hour period, 12 Bufferin tablets (equivalent to 60 grains of aspirin). Although 72 had a history of being sensitive to aspirin, only 18 reported any gastric side-effect with Bufferin.[2]

1. Effect of Buffering Agents on Absorption of Acetylsalicylic Acid. J. Am. Pharm. Assoc., Sc. Ed. 39:21, Jan. 1950
2. Gastric Tolerance for Aspirin and Buffered Aspirin. Ind. Med. 20:480, Oct. 1951

Accepted COUNCIL on DENTAL THERAPEUTICS AMERICAN DENTAL ASSOCIATION

INDICATIONS: Simple headaches, neuralgias, dysmenorrhea, muscular aches and pains, discomfort of colds and minor injuries. Particularly useful when gastric hyperacidity is a complication. Useful for relieving pain in the treatment of arthritis. Helpful for toothaches and pain following tooth extraction.

EACH BUFFERIN TABLET contains 5 grains of acetylsalicylic acid, together with optimum amounts of the antacids aluminum glycinate and magnesium carbonate.

AVAILABLE in vials of 12 and 36 tablets and in bottles of 100. Tablets scored for divided dosage.

BUFFERIN is a trade-mark of the Bristol-Myers Company.
Bristol-Myers Co., 19 West 50 St., New York 20, N. Y.

The NEW Crescent WIG-L-BUG

(Patented)

Here is the NEW, streamlined Model of the famous Wig-l-bug, the wonder electric-mortar-and-pestle that is placing amalgam work on a scientific basis. The dependable, trouble-free Wig-l-bug mechanism—that has proved so successful—is now housed in beautiful bakelite. And a New, accurate, easy-to-read electric timer has been added.

Requires only 7 to 10 seconds to triturate enough amalgam for the average filling. Saves time, prevents waste, produces uniformly perfect mixes with a smooth, fine texture. Use the Wig-l-bug with your preferred alloy.

Thru Your Dealer or Direct

Crescent DENTAL MANUFACTURING CO.

1839 South Pulaski Road, Chicago 23, Illinois

WHEN YOUR PATIENTS WANT TO KNOW ABOUT DIET—

Be prepared with a supply of "Diet and Dental Health"—a 16-page pamphlet that answers patients' questions in lay language. Authoritatively written, "Diet and Dental Health" contains the latest and best information on a subject in which there is great patient interest. Get a supply today!

A free, sample copy will be sent on request.

Order Department, AMERICAN DENTAL ASSOCIATION
222 East Superior Street, Chicago 11, Illinois

Prices for DIET AND DENTAL HEALTH:

☐ *25 Copies.....$ 3.00*
☐ *50 Copies.....$ 5.25*
☐ *100 Copies.....$ 8.90*

Please send remittance with order.

name _____

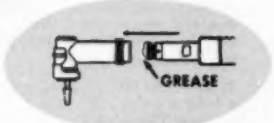
address _____

city _____ *zone* _____ *state* _____

please type or print

PRESSURE LUBRICATION

Pressure lubrication in handpieces—as in automobiles—has eliminated costly mechanical breakdowns due to oil failure. A new, vastly improved system of lubrication is only one of many features to be found in the DENSCO "Uni-Flex" Angle Handpieces. Precision-built interchangeable units give this popular "family" of instruments a flexibility of use never before found in handpiece construction.



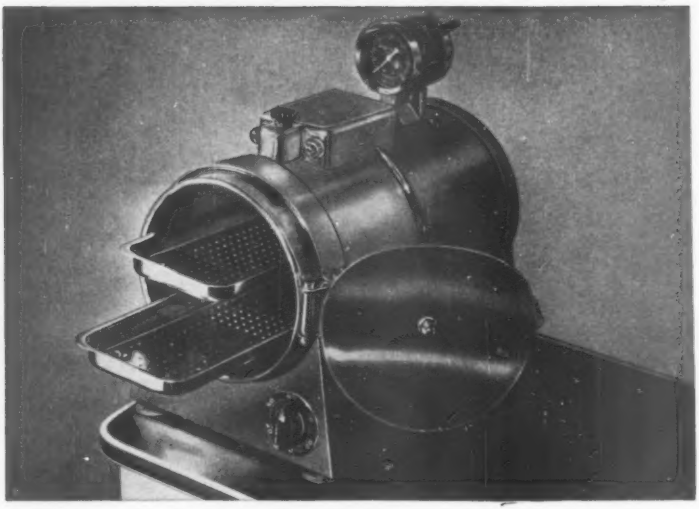
Quick, positive greasing is accomplished through the removable head construction; saves you money because of smoother operation—even at high speeds—and longer wear.

ASK YOUR SALESMAN FOR A DEMONSTRATION!

DENSCO

DENSCO, *Incorporated*

200 SANTA FE DRIVE • DENVER, COLORADO, U. S. A.



Now! Castle "777" Autoclave beats *boiling* 4 ways!

1. SAFER! Whenever you enter or expose the bloodstream, you need high temperature, pressure sterilization* . . . because boiling doesn't kill spore-bearers or viruses! But Castle's "777" Speed-Clave—sterilizing at over 250°F. with 15 to 20 lbs. pressure—gets them *all!* And your patients get true sterilization safety.

2. FASTER! "777" reaches spore-killing temperature in ⅓ the time it takes a boiler to reach only 212°F. (7 minutes from cold start! Or 3 minutes if warm). Then it kills all microbial life quicker than boiling kills bacteria only.

3. EASIER! You set the time and temperature desired. After that it runs itself without attention. 3 safety devices with water cut-off.

4. CHEAPER! "777" is priced no higher than cabinet type *boiler* sterilizers! Save 40%: buy unsterile dressings, autoclave them in the Speed-Clave . . . also, your instruments last longer: less rust and dulling.

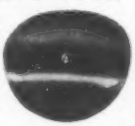
Attractive all-stainless steel, the "777" Speed-Clave uses current only when autoclaving. Hence saves electricity and lessens heat and steam in the office.

For demonstration, phone your Castle dealer, or write: Wilmot Castle Co., 1104 University Ave., Rochester 7, N. Y.

CASTLE SPRING-SEAL DOOR

Only Castle has this ultra safe, flexible door (tested to 80 lbs. pressure).

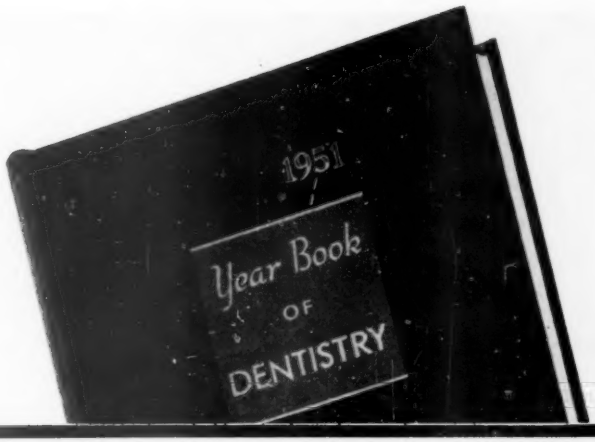
It is the secret of the "777" success because it keeps total weight down to 15 lbs., allowing high speed and low cost.



**Bibliography and reprints on request.*

Castle

LIGHTS AND STERILIZERS



The New Year Book of Dentistry

A NEW BOOK — NOT A REVISION

Off Press January 15th

The New 1951 Year Book of Dentistry—*ready Jan. 15th*—gives comprehensive application of latest advances in dental practice as reported during the past year in leading international dental periodicals—for example: new and improved methods of *treating caries*, latest handling of *children's teeth*, *new technics in orthodontia*, latest advances in *oral pathology*, new dental *materials and equipment* and their value, new and important developments in making and fitting *prostheses*, new and improved technics in *oral surgery*. A special feature of the Year Book is the helpful *Evaluation* and *Interpretation* provided through the editors' personal comments—*Edited by Stanley D. Tylman, D.D.S., Donald A. Keys, D.D.S., John W. Knutson, D.D.S., George R. Moore, D.D.S., Hamilton B. G. Robinson, D.D.S., and Carl W. Waldron, M.D., D.D.S.* about 528 pages, 334 illustrations, $5.00.

"SOMETHING NEW—SOMETHING VITAL TO EVERY DENTIST," says the *Journal of the Ohio State Dental Society.*

Send Today for Your 10-Day Examination Copy

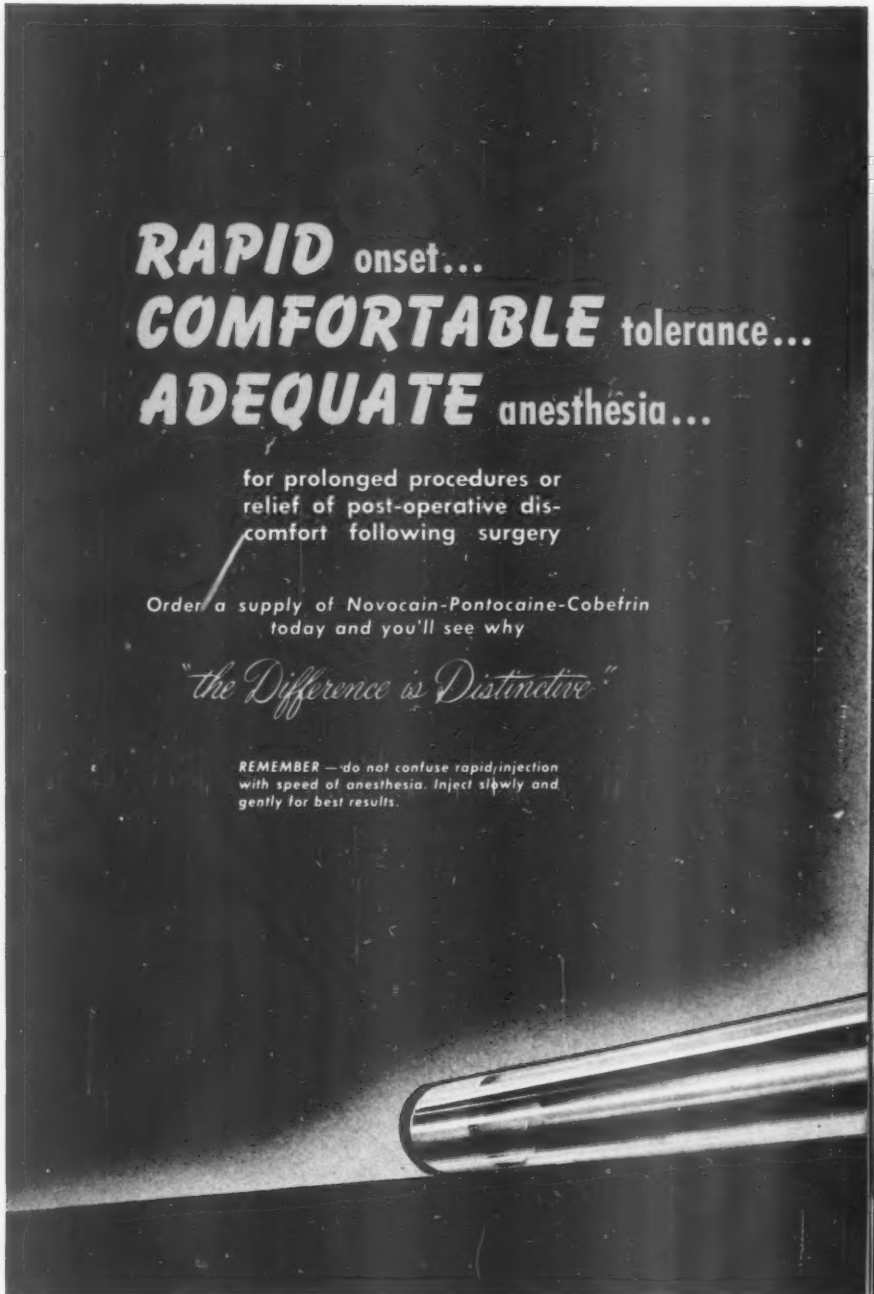
ORDER FORM

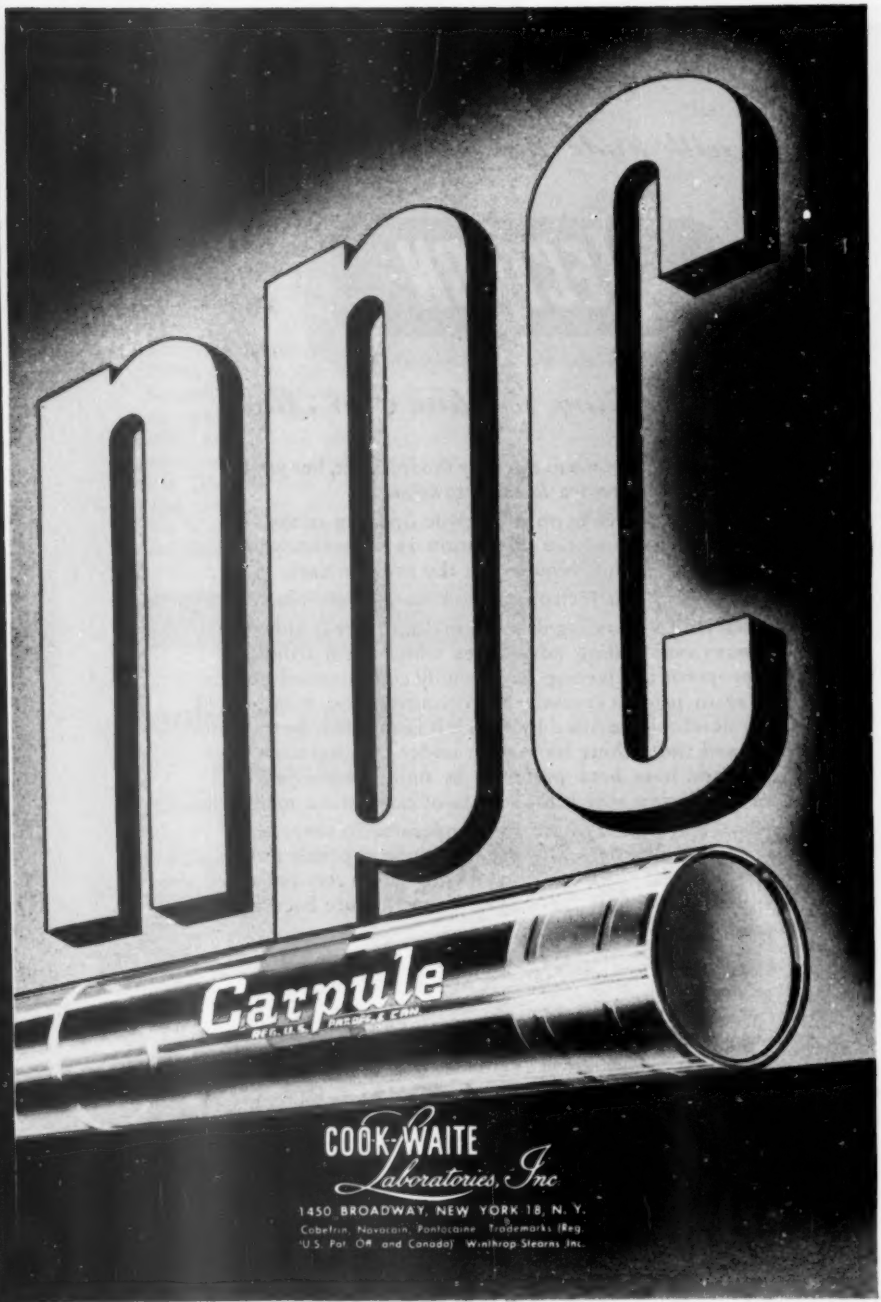
The Year Book Publishers, Inc., 200 E. Illinois St., Chicago 11, Ill.
Please send me, postpaid, for 10 days' free examination
☐ The 1951 Year Book of Dentistry, $5.00.

Name ..... Street .....

City ..... Zone ..... State .....

JADA 1-52


RAPID onset...
COMFORTABLE tolerance...
ADEQUATE anesthesia...
for prolonged procedures or relief of post-operative discomfort following surgery
Order a supply of Novocain-Pontocaine-Cobefrin today and you'll see why
"the Difference is Distinctive"
REMEMBER — do not confuse rapid injection with speed of anesthesia. Inject slowly and gently for best results.


npc
Carpule
COOK-WAITE
Laboratories, Inc
1450 BROADWAY, NEW YORK 18, N. Y.
Cobefrin, Novocain, Pontocaine Trademarks (Reg. U.S. Pat. Off. and Canada) Winthrop Stearns Inc.

Presenting

. . with pride and confidence . .

The Best-Fitting Denture Ever Made

By "best-fitting" we mean not only the initial fit, but *permanence of fit*—and therefore *lasting retention.*

We mean that there is no noticeable opening of the bite during processing, and the adaptation is so accurate that "after-trimming" is not required in the average case.

And we mean that Jectron *will not warp when rebased.*

But that isn't all. Lasting dimensional accuracy is only one of the *many* outstanding advantages which stem from the unique properties of Jectron—a specially compounded polystyrene resin made expressly for dentures—and from the specially developed method by which it is molded. Both the material and the technic have been under development for ten years, and have been perfected by more than a year of field-testing during which thousands of cases were made.

Perhaps a laboratory near you cooperated in these tests, or has since equipped itself to produce these superbly fitting dentures. We will be glad to let you know upon request, and include the booklet "Jectron's 20 Keys to Denture Success." Just mail the coupon, or write.

THE TOLEDO DENTAL PRODUCTS COMPANY
Toledo 1, Ohio
Please send Jectron booklet and name of nearest Jectron laboratory.

Dr.....

Street Address.....

City.....Zone.....State.....

JI

ULTRA BRAND
Fine Cut
FILLING ALLOY

The Superior qualities of our Ultra Brand Filling Alloy are well known to the dental profession. The silky fine cut insures an exceptional smooth mix. Has high edge strength and permanent silvery-white color. It is uniform in all properties. This moderately priced, fine grained alloy will exceed all your expectations. Try it once, and you will use it again and again. Ask your dealer.

H. JELINEK DENTAL ALLOYS
93 NASSAU ST. NEW YORK 7, N. Y.

THE
MEDICAL
PROTECTIVE
COMPANY
FORT WAYNE,
INDIANA

PROFESSIONAL PROTECTION
EXCLUSIVELY
SINCE 1899

specialized service
assures *"know-how"*

Coolidge and Hine—Periodontia

Clinical Pathology and Treatment of the Periodontal Tissues

By EDGAR D. COOLIDGE, D.D.S.
Professor Emeritus of Therapeutics, Preventive Dentistry and Oral Hygiene, Chicago College of Dental Surgery, School of Dentistry, Loyola University, Chicago

and MAYNARD K. HINE, D.D.S.
Professor of Periodontia and Histopathology and Dean, Indiana University School of Dentistry, Indianapolis

Fully up to date! In this book the authors provide a text that will be most helpful in the study of the symptoms, diagnosis and treatment of periodontal diseases. Full discussions are devoted to gradual changes in soft tissue, pathologic conditions, trauma and home care.

318 Pages. 378 Illustrations on 219 Figures and 2 Plates in Color. $6.00

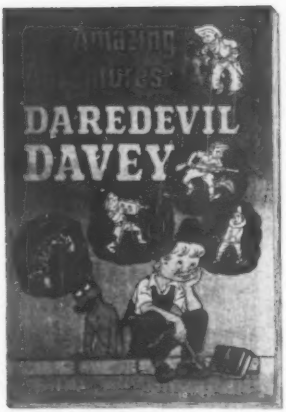
Feldman—Exodontia

By M. HILLEL FELDMAN, D.D.S., F.I.C.A.
Director of Dentistry, Lincoln Hospital, Department of Hospitals, City of New York

New (4th) edition. Dr. Feldman presents a practical guide for dentists who give exodontic service to his clientele. It is not meant for the specialist in this field. The author's objective is to point the way to removal of a tooth with a minimum of trauma to tissue locally and to the systemic organism in general. More than 100 illustrations have been replaced by new ones. There is a chapter on Dental Malpractice Jurisprudence by Mr. Michael A. Hayes, of the New York Bar.

New (4th) Edition. 290 Pages. 322 Illustrations. $6.50

Washington Square **LEA & FEBIGER** Philadelphia 6, Pa.



THE AMAZING ADVENTURES OF DAREDEVIL DAVEY

Youngsters love this new comic book that tells, in exciting story form, the advantages of dental health. Daredevil Davey is a small boy whose hair-raising adventures in the land of imagination take him from darkest Africa to our own wild West. Davey's dentist is right on hand, between trips, to help point out the important health messages given throughout the book.

You'll find "The Amazing Adventures of Daredevil Davey" an excellent way to educate children on the importance of dental health. Parents and teachers, as well as the children themselves, will appreciate copies, and you'll want several for your reception room. A free copy will be sent on request.

use this order blank

Order Department, AMERICAN DENTAL ASSOCIATION
222 East Superior Street, Chicago 11, Illinois

Check the order you wish to place for THE AMAZING ADVENTURES OF DAREDEVIL DAVEY booklets:

- ☐ *25 Copies . . . . . $ 2.75*
- ☐ *50 Copies . . . . . $ 5.00*
- ☐ *100 Copies . . . . . $ 8.70*

Please send remittance with order

name _____

address _____

city _____ *zone* _____ *state* _____

please type or print

JANUARY 1952 VOLUME 44 • NUMBER 1

THE Journal OF THE AMERICAN DENTAL ASSOCIATION

Management of injured teeth

Henry Marsh Wilbur, D.D.S., M.S., Louisville, Ky.

While injuries involving the teeth are relatively infrequent, they do occur regularly and the complications resulting from some of them are of sufficient severity to warrant attention being paid to all of them. Fractured teeth which have had no treatment have been observed years later, and have undergone no detrimental change except for the lost portion of the tooth. The patient, however, is not in a position to judge whether an accident is innocuous or not. The dentist should not give such assurance without a thorough and complete examination and an evaluation of all of the factors involved in the case. It is the dentist's responsibility to inform his patients that each injury to the teeth requires professional attention at once, and to prepare himself to manage each case. Such management may be simply the obtaining of a history and a roentgenographic record for future reference, or it may be a complete and comprehensive treatment.

There are conditions which make some persons more susceptible to injuries to the teeth. Protrusion of the upper anterior teeth may be a predisposing factor, since these protruded teeth would be the first point of contact for an object directed at the face. However, injuries have been observed in which the upper incisors were behind the line of the arch. These injuries have been caused by a forceful occlusion of the teeth from a blow to the chin. Another predisposing factor is "accident proneness," the frequent recurrence of accidents to certain persons. This factor would influence the election of the type of treatment the dentists may make, as well as the prognosis for that treatment. The increased hazard of injuries to malaligned teeth is an added reason for orthodontic treatment. The treatment for accident prone-

Presented before the Section on Operative Dentistry, ninety-first annual session of the American Dental Association, Atlantic City, November 1, 1950.

Associate professor of restorative dentistry and pedodontics, University of Louisville, School of Dentistry, Louisville, Ky.

ness, however, is theoretical as yet, and is out of the dentist's hands.

Accidental injuries to the teeth occur frequently among teen age children and young adults who are active in sports. Injuries to the faces and mouths of drivers and passengers in automobiles have greatly increased in number and severity with the tremendous increase in the number of motor vehicles. The passenger riding beside the driver suffers injury, as compared to the driver, in a proportion of about three to one. Claire L. Straith has made a comprehensive study of injuries to the face and mouth resulting from automobile accidents.[1] According to Straith, "Children are in the most dangerous position in the car when riding on Mother's knee or standing up in front." Frequently children's teeth are fractured by hitting the dash in sudden stops. As a result of his study, Straith recommends a crash pad for the dash to protect the passenger from violent impact with the dash and its many knobs and protuberances.

After plastic and oral surgery have been completed for victims of automobile accidents, the dentist may be called upon to repair injuries to the teeth themselves. The principles of stabilization and splinting may be applied to sections of the arch, a block of teeth which have been fractured *in toto,* or a single tooth which has been loosened.

EXAMINATION AND DIAGNOSIS

The examination and diagnosis should consist of a history, a roentgenographic survey and a direct or clinical examination.

In obtaining a history, it is important to find out how the accident occurred. More than one tooth may be involved, especially if the maxillary incisors protrude. An upward blow to the chin may produce injury to both upper and lower teeth. The chances are better for maintaining pulpal vitality if it is the patient's first accident as compared with those chances if there have been repeated blows. The chances for a successful treatment are better the shorter the time since the injury. It is also important to inquire what symptoms have been experienced since the accident.

A roentgenographic survey of the involved regions should be made to determine the presence or absence of root fractures; to determine the presence or absence of periapical pathosis and the amount of apical maturation; to determine the proximity of the fracture to the pulp; to provide a record for future reference in cases where the reaction of the pulp to the blow may be unknown and an observation period is advisable.

The direct or clinical examination should include an observation of the teeth in centric and eccentric occlusion; a test for abnormal mobility; a determination of whether or not the tooth fracture involves the pulp; a notation of the size and extent of the fracture and the color of the tooth; a pulp test. If any pulp test is employed, it should be remembered that the pulp may be in a state of shock as a result of the blow, and consequently may not respond for varying periods. It has been reported that return of sensibility of the pulp to an ice test has been delayed for as long as six weeks.[2] A change in the color of the tooth may indicate pulpal pathosis.

Injuries affecting the deciduous incisors may be evidenced by a progressive darkening of the affected tooth or teeth caused by the extravasation of blood in the pulp. Experience has shown that, as often as not, the clot will organize and the discoloration will gradually disappear. If the clot does not organize and the pulp continues to degenerate, with eventual abscess formation, it is usually necessary to extract the tooth.

1. Straith, Claire L. Guest passenger injuries. J.A.M.A. 137:348 (May 22) 1948.

2. Ireland, Ralph L. Reported at meeting of American Academy of Pedodontics, February 13-15, 1947, Ann Arbor, Mich.

An accident involving a deciduous incisor may produce a displacement of the tooth either to the labial or to the lingual, or an intrusion. There is a strong tendency for a deciduous incisor which has been driven into the alveolar process to re-erupt if left alone. If a deciduous incisor which has been displaced labially or lingually can be brought back into the line of the arch and stabilized there, it will frequently heal without complications.

The loss of a deciduous incisor is usually of little significance because the strong tendency for lateral alveolar growth obviates the necessity for space maintenance. Occasionally such a loss is of grave concern to the parents from an esthetic standpoint. Children will tolerate removable partial dentures extremely well, or a satisfactory fixed replacement may be constructed by attaching the facing to a lingual arch.

TREATMENT

The treatment of all injuries to the teeth may be divided into three stages; emergency, intermediate and final. The first of these may be by-passed, if a fracture occurred several months previous to examination. Any pulp damage would already be evidenced in the roentgenographic examination, or by discoloration, or by absence of response to a pulp test. By the same token, a fracture occurring in a young adult would not necessitate an intermediate treatment since there need be no waiting period for maturation to occur. Generally speaking, in a young individual some emergency measures are necessary.

An emergency measure may consist of stabilization. Stabilization may be quickly and simply supplied by a figure eight ligation of a number of anterior teeth, using fine stainless steel ligature wire. A more rigid form of stabilization, especially useful where a tooth has been displaced labially or lingually, is illustrated in Figure 1. Each tooth, except the involved one, carries double stainless steel ligatures, the twisted ends of which are again twisted together over the arch, thus serving to maintain the arch wire firmly in place. In the illustration the upper left central incisor is ligated to the arch wire with a single ligature. These forms of stabilization do not interfere with occlusion, may be applied rapidly and are just as firm as a cast splint.

Fig. 1 • Ligation for stabilizing a deciduous upper left central incisor which was displaced as the result of a blow

If a tooth has been fractured, but the fracture does not involve the pulp, it also should have emergency treatment. Here it is good practice to cover the fractured surface with a sedative dressing for two to four weeks in order to allow the pulp to recover from the effects of the blow. This sedative dressing, usually of zinc oxide and eugenol, may be maintained in place over the fractured surface by silicate cement which is contained in a celluloid crown form (Fig. 2, left), or the involved tooth may have an orthodontic band adapted to it which will be filled with zinc phosphate cement (Fig. 2, right).

If the pulp is involved, either a pulpotomy or a pulpectomy may be performed. While pulp capping has been suggested as a treatment for minute pulp exposures, it is not recommended because results are too uncertain. Glass and

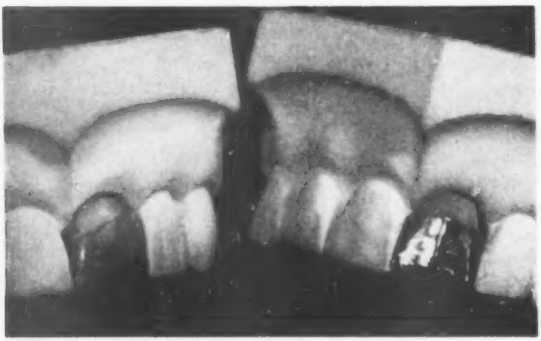


Fig. 2 • Left: Celluloid crown filled with silicate cement will hold sedative dressing, usually zinc oxide and eugenol, in place. Right: Involved tooth may have an orthodontic band adapted to it filled with zinc phosphate cement

Zander[3] reported the use of calcium hydroxide as a pulp capping material. Certainly the pulp capping procedure has the recommendation of simplicity, but it would be limited to those cases in which the size of the exposure is small.

The treatment of the fractured tooth varies, depending on the amount of tooth structure lost or the position of the fracture. If dentin is not involved, the treatment consists simply of smoothing off the fractured surface. A fracture line running through the gingival sulcus condemns the tooth to extraction. Pulp therapy would be obviated because it would be impossible to prevent contamination. A root fracture in the apical third usually heals spontaneously, but a root fracture in the coronal third usually means loss of the tooth. The remaining root is not of sufficient length to support the crown in function.

Intermediate restorations for children is a term used to indicate a type of restoration which will serve longer than the so-called "temporary restoration," but which is not intended to be permanent. The large size of the pulp chamber and the fact that the clinical crown has not reached its adult length prevents a preparation deep enough for a permanent restoration. Here is a brief description of some restorations which seem to have the most general usefulness. All of the restorations described are characterized by a minimum amount of preparation, and are of the overlay type.

Shoulderless Acrylic Crown • The preparation for this restoration consists of proximal reductions, a smoothing of the fracture line, a reduction of any uninvolved incisal enamel and a slight reduction of the cervical bulge on the labial surface. Figure 3, left illustrates a fractured upper left central incisor which has been prepared to receive a shoulderless acrylic crown. None of the axial reduction is sufficient to penetrate the dentin, but is confined to the enamel. An elastic impression is taken of the whole anterior section of the involved arch and a stone cast is poured. An opposing cast is necessary if the anterior teeth occlude. On the stone cast the gingival margin is trimmed so that the wax pattern will be carried about 1 mm. beneath the free border of the gum. This trimming of the cast should leave a sharp definite ledge which, when reproduced in the restoration, considerably facilitates final finishing. The wax pattern is developed with a definite thickness of its gingival border to facilitate packing and processing. The wax

3. Glass, R. L., and Zander, H. A.: Pulp healing. J. D. Res. 28:97 (April) 1949.

pattern is then flasked and processed in acrylic in the usual way.

This type of restoration, although satisfying from an esthetic standpoint (Fig. 3, right), sometimes does not prove to be so durable, and in the clinic of the University of Louisville, School of Dentistry, has been supplanted by a cast gold three-quarter crown type of restoration with a window of silicate cement or acrylic.

Cast Gold Three-Quarter Crown With A Window • The preparation for this restoration may consist of double angled proximal slices whose clasping action obviates any further preparation for retention. A model of this preparation may be seen to the left in Figure 4, A. The model to the right in Figure 4, A illustrates a thin three-quarter crown preparation with a pin hole in the cingulum for additional retention. In the preparation using the cingulum pin, the no. 700 tapering cross-cut fissure burr used to prepare the hole is directed parallel to the long axis of the tooth; then it will be paralleling the lingual wall of the pulp chamber and the danger of pulp exposure will be minimized. Usually no lingual reduction is necessary because the tooth has not developed into occlusal contact. Smoothing of the fracture line is usually all of the incisal preparation necessary. An elastic impression of the whole anterior section of the involved arch is taken, and an investment cast is poured (Fig. 4, B). A model of the opposing arch is secured if the anterior teeth occlude. The investment cast is moistened and an additional mix of investment is added to restore the normal contours of the fractured area (Fig. 4, C). The adjacent teeth are left intact on the investment cast until this building up has been done, since they are used as a guide in developing the normal incisal edge. After the investment cast has been built up, the adjacent teeth may be cut away so that the interproximal investment may be trimmed about 1 mm. below the crest of the soft tissue (Fig. 4, D). This trimming is contoured around the tooth and developed into a sharp definite ledge which facilitates finishing the restoration.

The waxing procedure is started by dabbing some melted sheet casting wax on the dry investment cast. The investment cast is passed through a flame so that the wax flows over the whole surface and soaks in. When a small piece of sheet casting wax (28 gage) is adapted to the cast, it will be softened by the warm cast, and will stick to the previously applied wax. Blue inlay wax is used to thicken the wax pattern in the area of the gingival margin so that it will cast full, and in the area of the marginal ridges to develop a structural shape which will make

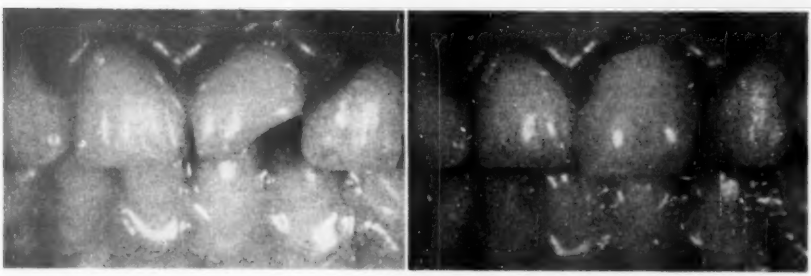


Fig. 3 • Left: Fractured upper left central incisor which has been prepared to receive a shoulderless acrylic crown. Right: Acrylic crown cemented in place

a stiffer restoration (Fig. 4, E). The wax pattern is sprued, invested and cast in a type B (medium) gold.

In finishing, the gingival border is knife-edged to the previously determined ledge made in trimming the investment cast. Figure 4, F compares the finished restorations made in the two different ways. The double angled slice preparation has the disadvantage of a greater display of gold. The facing material, of either silicate cement or acrylic, will have some added retention and considerably better esthetic values (Fig. 4, G) if the window is cut through to the lingual side (Fig. 4, H). In cementing the fin-

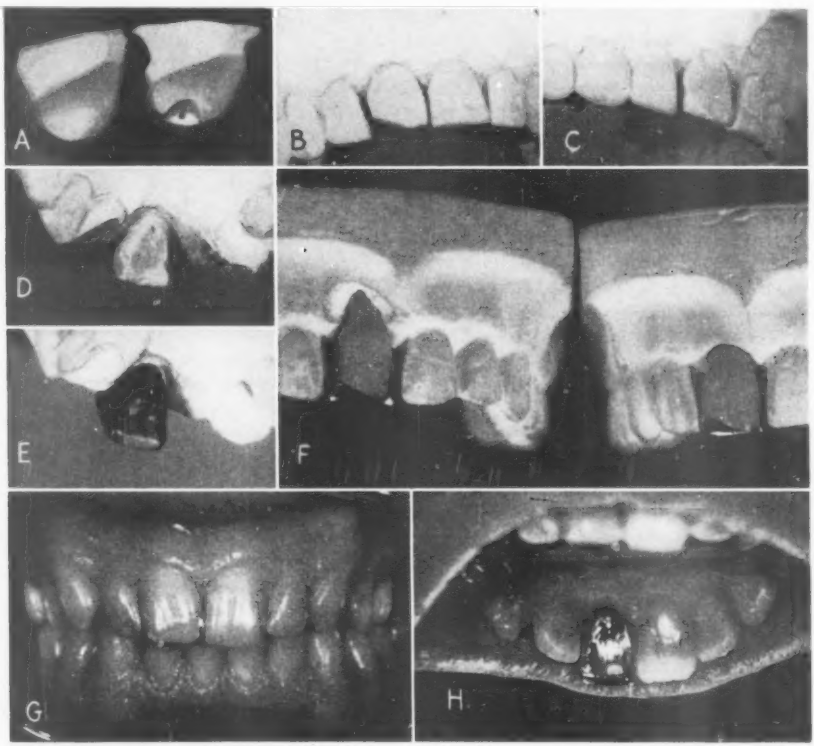


Fig. 4 • A: Model to the left shows the double angled proximal slices whose clasping action obviates any further preparation for retention. The model to the right shows a thin three-quarter crown preparation with a pin hole in the cingulum for additional retention. B: Investment poured from the elastic impression. C: Cast has been moistened and investment material added to restore the normal contours of the fractured area. D: Illustrates the method of trimming the gingival border to form a sharp ledge extending 1 mm. below the gingiva. E: Pink sheet casting wax thickened in the areas of the marginal ridges and the gingival border. F: Finished restorations made in the two ways. The double angled slice preparation has the disadvantage of a greater display of gold. G: Thin three-quarter crown with a cingulum pin seated on the upper right central incisor. Facing material is made of silicate cement. H: Esthetics are improved by cutting a window through the lingual side

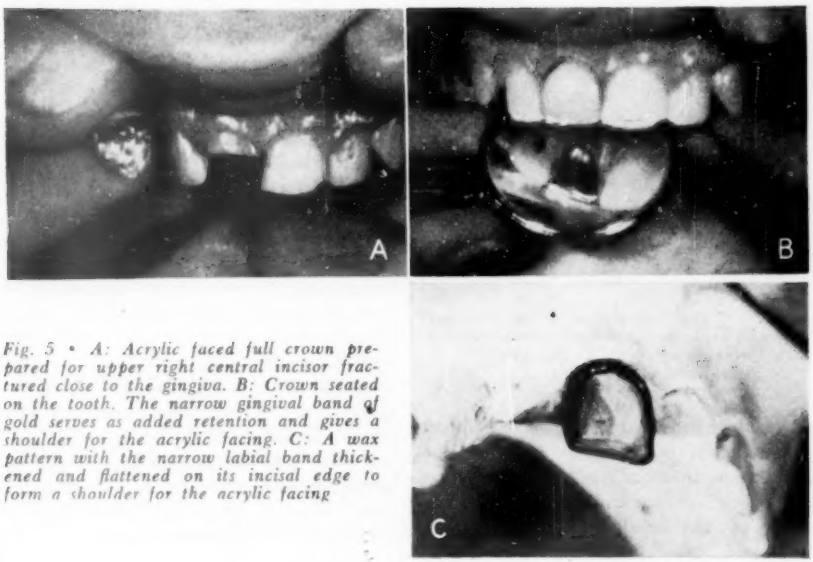


Fig. 5 • A: Acrylic faced full crown prepared for upper right central incisor fractured close to the gingiva. B: Crown seated on the tooth. The narrow gingival band of gold serves as added retention and gives a shoulder for the acrylic facing. C: A wax pattern with the narrow labial band thickened and flattened on its incisal edge to form a shoulder for the acrylic facing

ished restoration to place, it is nice to leave a small amount of zinc oxide eugenol cement over the dentin as a dressing.

Acrylic Faced Full Crown • The acrylic faced full crown is another type of intermediate restoration which is indicated in more extensive crown fractures where there is little if any proximal surfaces of the tooth exposed (Fig. 5, A). About the only preparation necessary for this type of restoration is a long bevel at the labial side of the fracture line. The acrylic facing is thin where it overlays the labial tooth enamel and is thick where it restores the lost tooth structure. This long bevel makes a gradual transition from the thin to the thick parts of the acrylic facing and prevents a definite line of demarcation from being apparent. Otherwise, the construction of the restoration is about the same as has been outlined, except that a narrow band of gold is carried around the labiogingival border, after the fashion of the old open faced crown (Fig. 5, B). The incisal edge of this labial section is thickened and flattened in order to form a shoulder for the acrylic facing (Fig. 5, C).

If a permanent tooth has been completely avulsed, or has been extracted, its replacement presents problems during the growth period. A removable acrylic palate, carrying a tooth, is probably the most versatile and satisfactory replacement because of the ease of construction and the possibility for changes to accommodate to growth and development of the jaws. Clasp retention for such an appliance can usually be obtained in the molar region and sometimes also in the cuspid region. The rest of the denture base should be trimmed away from the lingual surfaces of the teeth so that the soft tissues are not pinched between the denture base and the teeth. Embrasure extensions for retention are not suitable in these appliances which may have to be worn for several years. The clasps are unconventional in that they do not have

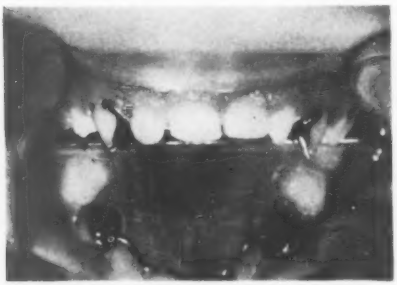


Fig. 6 • Upper left central incisor of 4 year old child replaced by a fixed partial denture, with spring attachments to the cuspids

occlusal rests and frequently consist merely of a buccal arm of wire, the acrylic base material itself bearing against the lingual surface and preventing movement of the tooth. These appliances are more useful during the later stages of the period of the mixed dentition and in the early teen ages. In the later teen ages a fixed appliance may be constructed by attaching the facing to a lingual arch. The arch wire may be attached to orthodontic bands cemented to molar teeth, or attached to cast "open faced" crowns cemented to the cuspid teeth (Fig. 6). The idea is that the facing has a spring attachment to whatever abutment or abutments are utilized.

Final Treatment • The final restoration for almost any kind of fractured incisor is usually a jacket crown constructed of either porcelain or acrylic. In cases where the fracture is extensive and has necessitated pulp therapy, a dowel crown of either porcelain or acrylic is usually the final type of restoration. Where root canal therapy has been performed, there may be debate as to whether the restoration at that time should be intermediate or final. If a jacket or dowel crown is constructed for a teen age patient, there is almost sure to be some exposure of the gingival margin of the crown as the tooth continues to grow (Fig. 7). Whether it is more practicable to construct two "final" restorations, or to construct an intermediate and later a final restoration, is a matter of personal preference.

Where a tooth has been lost as the result of an accident, the final restoration will probably be a fixed partial denture. The time when such a restoration should be constructed is variable and depends on the maturation of the abutment teeth. Sometimes the teeth are stimulated to form a deposit of secondary dentin more rapidly as a result of an injury, and consequently will come early to the stage when a final restoration can be constructed. Continuous observation is necessary to determine what will occur in any one case. The decision as to the type of partial denture replacement in a fracture case is the same as for the replacement of a tooth lost for any other reason.

SUMMARY

It is important that parents be informed of the necessity for professional attention as soon as an accident involving the teeth occurs, because the extent and severity of the injury cannot be determined without a thorough and complete examina-

Fig. 7 • Acrylic dowel crown seated on upper left central incisor several years previously now shows a slight exposure of the gingival margin because of added growth of the tooth

tion. It is likewise important for the dentist to be prepared to manage each case as it occurs.

A careful examination and diagnosis should be made in each case of accidental injury to the teeth, even if little or no treatment has to be instituted.

Often a modified or compromise restoration must be constructed in order to allow maturation to take place. Those restorations found to be more generally useful and satisfactory are a three-quarter crown, with a window of silicate cement or acrylic, and an acrylic faced full crown.

Teeth which have been lost as the result of an accident may be readily replaced by a removable partial denture, to be worn until growth is completed.

When growth is completed, a final restoration for the fractured tooth or teeth may be constructed.

Surgical correction of abnormal pterygomandibular fold

Julius G. Godwin, D.D.S., St. Louis

Examination of a 40 year old edentulous patient disclosed an abnormality of the right pterygomandibular fold. When the patient opened her mouth the fold showed an unusual forward extension into the oral cavity. It resembled a web or curtain extending from the occlusal portion of the tuberosity down to the region of the retromolar pad (Fig. 1).

Except for a tonsillectomy in early childhood, nothing definite could be ascertained from the history as to the cause of the abnormality. No gross irregularity was found in the corresponding region on the left side. Full denture construction was attempted. However, the unusual forward thrust of the tendon prevented successful denture retention, breaking the peripheral seal in the region of the right hamular notch and the region medial to it. Surgical intervention was instituted.

Before presenting the steps taken for correction of this abnormality, a short résumé of the particular region in question will be given, as it presents itself to the anatomist, prosthodontist and oral surgeon.

ANATOMIC CONSIDERATIONS

The pterygomandibular ligament is a narrow, tendinous band that extends from the hamulus of the medial pterygoid plate of the sphenoid bone to the posterior end of the mylohyoid ridge of the mandible. Anteriorly, it gives attachment to fibers of the buccinator

Presented at the tenth annual Mid-Continental Dental Congress of the St. Louis Dental Society, St. Louis, November 29, 1950.

Former instructor, department of exodontia and oral surgery, St. Louis University, School of Dentistry, St. Louis.

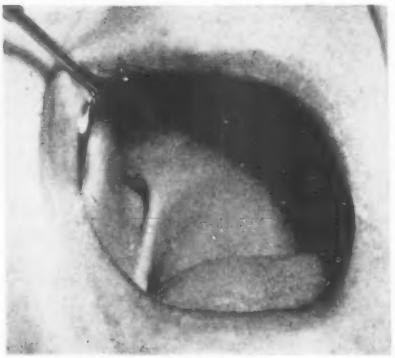


Fig. 1 • Unusual forward extension of the right pterygomandibular fold into the oral cavity, preventing successful denture retention

muscle and posteriorly to fibers of the superior constrictor muscle of the pharynx.

The pterygomandibular fold is a fold of mucous membrane, which is elevated by the underlying pterygomandibular ligament and may become especially prominent, if the mouth is opened wide. It stretches from the region of the hamulus and the medial and posterior aspect of the tuberosity to the retromolar pad.[1]

Almost directly behind the pterygomandibular ligament is the anterior border of the internal pterygoid muscle. A few fibers of the buccinator, the internal and external pterygoid muscles have their origin on the posterior aspect of the tuberosity. Situated between the tuberosity and the pterygoid hamulus is the pterygomaxillary notch or hamular notch. This notch is bridged by a small ligament,[1] which may be considered as an extension of the pterygomandibular ligament. The uppermost fibers of the superior constrictor muscle and fibers of the buccinator muscle take a fraction of their origin from this small ligament. As the tendon of the tensor palati muscle pierces through a gap between fibers of the buccinator muscle,[2] it curves around the hamulus and has the small ligament above it, which bridges the hamular notch. The tendon then inserts itself into the palatine aponeurosis, which is attached to the palatine bone in a fanlike expansion (Fig. 2).

Confined to the anterior part of the soft palate the aponeurosis contains practically no muscular fibers and is derived mainly from the tendons of the two tensor palati muscles.[3] It has an extremely thick layer of glands and is covered by mucous membranes on both surfaces. Several palatine muscles are attached to the aponeurosis. The greater (posterior) and lesser palatine foramens are situated on the pyramidal process of the palatine bone, just medial to the tuberosity (Fig. 2).

FULL DENTURE CONSIDERATIONS

From the prosthetic standpoint the region about the hamular notch forms a portion of the posterior boundary of the upper denture. The muscle fibers, tendons, adipose and connective tissues provide a cushion in that region, which is resilient and capable of withstanding considerable postdam pressure in most cases.

This region has been termed a valve-producing area, securing a seal for the periphery of the denture. It extends medially into the area overlying the greater and lesser foramens and then follows the "vibrating line," which divides the movable from the immovable structures of the palate.

As any part or structure of the body, the hamular notch and its contents are subject to variation. The muscles, ligaments, tendons, adipose, glandular and connective tissues show different pat-

1. Sicher, H. Oral anatomy. St. Louis, C. V. Mosby, 1949, p. 188.
2. Cunningham, D. J. Text-book of anatomy, ed. 6. New York, Oxford University Press, 1931, p. 392.
3. Grant, J. C. B. A method of anatomy. Baltimore, Williams & Wilkins, 1948, p. 736.

terns in that region, but are usually limited in their activity and are not disturbing to the prosthodontist. A submucosa, rich in collagenous fibers, may present difficulties in obtaining full functional effectiveness of the denture periphery. The amount of collagenous tissue of the tensor palati muscle, as it passes around the hamular process, will greatly influence the posterior extent and contour of the denture. At times this muscle may be a disturbing factor in denture retention.[4] The pterygomandibular fold with its underlying ligaments, tendons and muscles may present unusual size, shape and action which can offset all efforts to obtain successful denture retention. Surgical intervention may be deemed necessary in such a case.

SURGICAL CONSIDERATIONS

A plan of operation had to be selected to find the best procedure for correction of the abnormal pterygomandibular fold described. From the anatomical, functional and prosthetic standpoint, important structures are situated in that region.

It is usually not advisable to make injections of local anesthetics in this region for fear of infiltrating the solution into the neighboring muscles, the buccinator, internal pterygoid, superior constrictor, tensor palati, causing subsequent edema and possible infection.

4. Pendleton, E. C. Biologic factors in retention of dentures. J.A.D.A. 23:1233 (July) 1936.

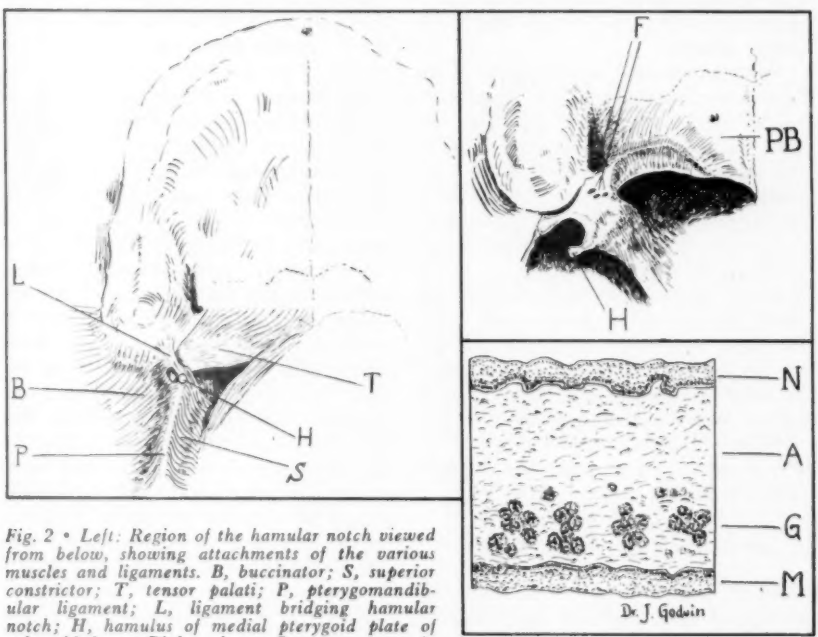


Fig. 2 • Left: Region of the hamular notch viewed from below, showing attachments of the various muscles and ligaments. B, buccinator; S, superior constrictor; T, tensor palati; P, pterygomandibular ligament; L, ligament bridging hamular notch; H, hamulus of medial pterygoid plate of sphenoid bone. Right, above: Bony structures in the region of the hamular notch. F, greater and lesser palatine foramens; H, hamulus; PB, palatine bone. Right, below: Cross section through soft palate near palatine bone. N, mucous membrane, nasopharynx; A, aponeurosis; G, lamina propria containing many glands; M, mucous membrane, mouth

When an operation is being performed in this region, a certain amount of trismus and painful deglutition would be anticipated, since tendons, ligaments and muscle attachments are to be severed. Impairment of function of the various muscles in this region, other than very transient, is not to be anticipated; the nerve supply is intricate and variable, with fibers of the fifth, seventh, ninth and tenth cranial nerves participating.

The segment of tissue to be removed was to be large enough to include most of the pterygomandibular fold with its underlying ligament, the small tendon bridging the hamular notch and some strands of the tendon of the tensor palati muscle. Incisions should not be carried so far posteriorly as to result in injury of the anterior border of the internal pterygoid muscle, which would impede movements of closing the mouth and cause undue trismus.

With the incision for severance of the buccinator muscle from its attachment to the pterygomandibular ligament, entrance is gained to the posterior half of the buccal space, which in turn leads into the pterygomandibular and parapharyngeal spaces. When indicated, such an incision is used to reach these spaces for drainage of infection.

In the operation to be performed, the tissues overlying the greater and lesser foramens with their corresponding vessels and nerves were not to be disturbed in order to preserve the blood supply and to secure a good seal for the periphery of the denture in that area. Care was to be taken to place the incision posterior to that area.

OPERATION

With the region under local anesthesia an incision was made on either side of the pterygomandibular fold starting at the region of the retromolar pad and extending upward to the tuberosity. These incisions were continued toward each other in a posterior direction until they met at a depth corresponding to the level of the hamulus (Fig. 3, A). At the distal end of the tuberosity the incisions were carried down to the periosteum, converging toward each other at the height of the tuberosity (Fig. 3, B). The triangular section of tissue thus formed was picked up with a hemostat, raised, carefully dissected free and removed in its entirety (Fig. 3, C).

At this stage, the tissue—particularly on the throat side of the fold—released itself and fell back toward the pharynx, indicating the great tension of the constrictor muscle and to a lesser degree of the buccinator muscle before the ligament was removed.

Prior to the operation the posterior boundary of the upper denture had been established and the periphery of the denture was built out in the region of the right hamular notch. After the excision of the fold a horizontal incision was made posterior to the posterior periphery of the denture, starting at a point midway between the palatine foveola and the hamulus and carrying it laterally into the region of the hamular notch where it terminated at the medial incision of the excised fold (Fig. 3, C). This incision was continued downward to a depth where oral and middle layers of the soft palate were severed. Care was exercised not to cut the upper (nasal) layer, which unites with the soft tissue covering the nasal surface of the hard palate at the posterior edge of the palatine bone. This step was considered necessary for allowing some of the palatal soft tissue to be carried downward for easier approximation of the wound surfaces and lessening lateral tension of the flaps. It was also hoped that this would tend to offset contracture and cause an eventual slight lengthening of the palate in a backward direction.

By careful dissection this palatal flap was undermined in a medial and posterior direction (Fig. 3, D), which further

facilitated approximation with a flap subsequently raised lateral to the site of the excised fold.

A sliding flap as designed in Figure 3, E was raised lateral to the excised fold from the mucosa of the cheek, shifted medially into its new position and sutured to the palatal flap. A relief incision was placed distal to the tuberosity to obtain sufficient mobility of the buccal flap.

The mucosa immediately lateral to the donor bed was widely undermined. As shown in Figure 3, F and G, the V-Y method was employed to approximate and suture the various wound edges. This procedure made it possible to close the donor bed without disturbing the repaired area. The possibility of contracture was further eliminated and tension of the approximating sutures was lessened.

Immediately following the operation the upper denture was inserted (Fig. 3, H). The patient was instructed to remove the denture only for cleaning. To forestall contracture, muscle exercises by frequent opening and closing of the mouth were advised.

POSTOPERATIVE CHANGES

On the day following the operation moderate trismus was noted. The tissues in the region of the operation were slightly edematous. There was a well formed sulcus distal to the right tuberosity. The wound edges of the flaps were in good

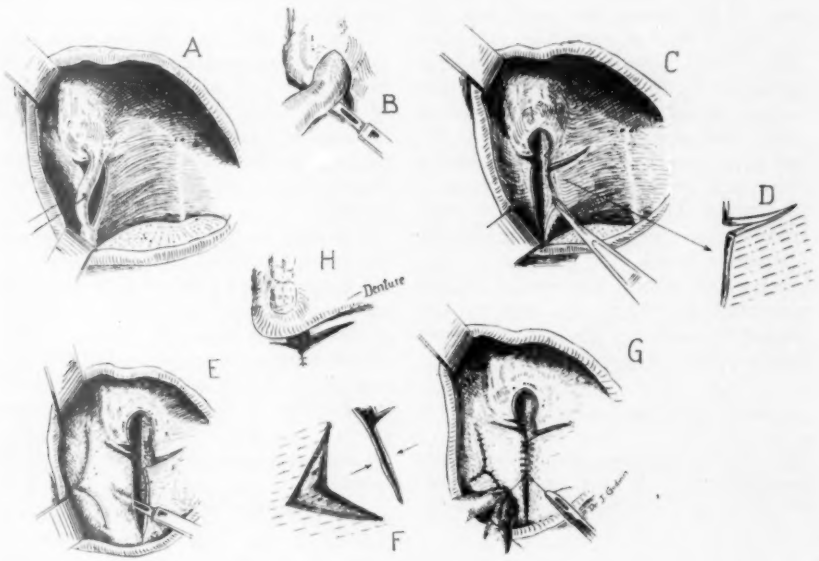


Fig. 3 • Various stages in the correction of abnormal pterygomandibular fold. A: Pterygomandibular fold raised prior to excision. B: Upper portion of fold to be excised at distal end of tuberosity. C: Incision on palatal side of hamular notch after excision of fold. D: Palatal flap to be undermined. E: Outline of sliding flap to be raised from mucosa of cheek. F: Sliding flap advanced toward site of excised fold. Mucosa lateral to donor region is freely undermined. G: Approximation and suturing of wound edges by V-Y method. H: Denture in place following operation

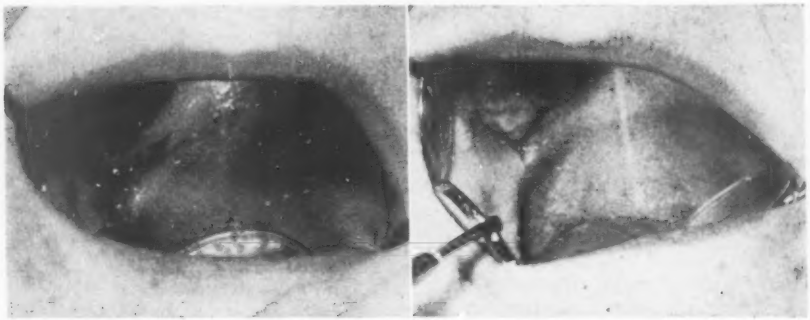


Fig. 4 • Left: Condition of operative site five days after operation. Right: Appearance of region several months after operation for correction of abnormal pterygomandibular fold

approximation. When swallowing, the patient experienced some pain in the ear.

On the fifth day after the operation, some of the sutures had given way and the buccal flap had opened up somewhat (Fig. 4, left). Granulation tissue had appeared on the surface of the wound. The patient could open her mouth much wider and experienced no pain in the ear when swallowing. She experienced only slight soreness in the throat when swallowing. There was no pain or even soreness from the denture. The denture apparently acted well as a splint supporting the tissues. Uneventful healing continued. Several months after the operation the outline of the buccal flap was faintly visible (Fig. 4, right).

FUNCTIONAL RESULTS

Prior to the operation the region of the hamular notch did not function normally because of the forward thrust of the pterygomandibular fold when the mouth was opened. After surgical intervention there was considerable improvement in function.

Although the area showed some scar mucous membrane, it was stable and immovable, not disturbing the retention of the denture. Since the edges of the incision were brought into close approximation, the amount of scarring was decreased and the chance of union increased.

The area medial to the tuberosity and the tissues overlying the greater and lesser foramens were intact and could be used as valve-producing areas. The blood supply was not impaired, since no major vessels were endangered during the operation. As far as could be ascertained, the function of the muscles, which were severed, was not impaired. Good stability and retention of the denture were achieved.

4456 Natural Bridge Avenue

Overcoming physiological and psychological blocks in dentistry for children

Frank F. Lamons, D.D.S., and Mary Lynn Morgan, D.D.S., Atlanta, Ga.*

Every dentist might well ask himself, "Am I conscientiously rendering a health service for which I have been educated or am I merely performing mechanical, restorative operations in the mouths of my patients." The variations in the replies received to this question may be attributed to a large degree to the type of education received by the dentists during their undergraduate years.

Some dental educators still do not fully appreciate what dental service means in terms of prevention, or what it can mean in terms of dental health if this concept is firmly planted in the mind of the graduate upon leaving school. The finest dental health service begins with children: a service which will enable them to grow up with healthy mouths.

An examination of most undergraduate dental curriculums reveals that of approximately 4,400 to 4,800 hours of instruction and practice, about 4 per cent are devoted to pedodontics. Dentists can be proud of this 4 per cent, however, since it has come about within the last few years. Indeed, it represents an evolutionary process which is taking place in undergraduate education. Further increase in this percentage will mean a further increase in better dental health service to the public.

It is not the inability of the dentist to restore deciduous teeth, nor is it his inability to manage his child patient that prevents his rendering an adequate service for children. More realistically perhaps, it is the difficulty encountered in receiving for that service a fee which compares favorably with that received for restorative and prosthetic dentistry.

Inadequate education as to the health value of dentistry for children creates this economic problem in the minds of both the parent and the dentist. The parent's lack of appreciation for the value of the service creates the feeling that it is too costly. On the other hand, the dentist who does not appreciate the value of this type of service is unwilling to demand a fair fee. Half-price for children's dental service usually means "half-way" dentistry, and indicates incomplete or "half-way" thinking. Each dentist must face and solve this problem if he hopes to fulfill his obligation to child patients and their parents.

Presented before the Section on Pedodontics and Oral Hygiene, ninety-first annual session of the American Dental Association, Atlantic City, November 1, 1950.

*Professor of orthodontics and chairman of the department of orthodontics, Emory University School of Dentistry, Atlanta, Ga.

A dentist who accepts child patients must be prepared to overcome certain psychological and physiological blocks which he inevitably encounters in rendering pedodontic service. Dr. Arnold Gesell[1] states: "No sharp line can be drawn between 'physiological and psychological' functions. A baby's satisfactions, needs, interests and drives are determined by the status of his entire organism, including metabolism, the chemistry of his body fluids and the tonus of his muscular system." Although a complete separation of the physiological and the psychological is impossible, this is the division chosen for this discussion.

PREVENTING AND INTERCEPTING BEHAVIOR PROBLEMS

The dentist must use the best of wits and kindest understanding to prevent and intercept behavior problems in child patients.

A child is entitled to the dentist's undivided time and attention which has been reserved especially for him. The general tone of the office should indicate that the time is for the child and that others must take second place. When his time is interrupted, it should be done as courteously as possible. A child feels abandoned when receiving divided attention.

The departure of the parent from the operating room brings miraculous results in almost every instance of behavior difficulty. Although there is no apparent behavior problem, the dentist's relationship with the child and the parent will be a happier one if the mother is dismissed to the reception room. If the child is a new patient, the mother should be given some informative dental literature to read.

A child must sense a feeling of confidence in each individual with whom he comes in contact. If he does not, he may become frightened or overbearing and demanding. The dentist and each auxiliary aid must know his place and the limit of his authority.

MEETING OF MINDS

When two individuals come together, there is a meeting of minds, and adjustments must be made. The dentist should be informed about the developmental phases of children and know at what ages their various abilities develop. He keeps available good reference books for both patients and their parents. In each relationship between dentist and child patient the dentist should try constantly to be the more adult member. It is juvenile and unkind to expect the child patient to make the major adjustments. The dentist should expect the child patient to anticipate with pleasure a dental appointment; he may not enjoy dental procedures, but he can enjoy his contact with the dentist and his personnel.

In dealing with adult patients, the dentist usually can act naturally. In dealing with children, he should adjust his behavior according to the psychological needs of the child. Parts of the dentist's personality must be adjusted to the age and development of each child patient, keeping in mind his mood, temperament and behavior background.

The dentist who is successful in handling children avoids words with unpleasant connotations such as hurt, ache, stick, shot and cut. He carefully selects descriptive words which will be meaningful to the young mind thereby preventing many psychological blocks. This rule applies not only to conversations held with the child but also to remarks addressed to his parents. He keeps dental health education at the proper level. Children can absorb a great deal in the hours spent in the dental office. On-the-spot education, if properly managed, becomes meaningful and enduring. He

1. Gesell, Arnold, and others. The child from five to ten. New York, Harper & Bros., 1946, p. 44.

teaches the child all he can grasp in terms of his experience and development.

THE NEW PATIENT

The first visit of a child to the dental office is an important one for the dentist, for the child, and for the child's parents. Before this first visit the dentist should be fortified with certain information about the child and the parent. In addition to the correct spelling and pronunciation of the patient's name, correct age and sex, he should know what type of conversation there has been between his secretary or assistant and the parent. Obtaining this information need not involve a great deal of time, but it is extremely important and, if done carefully, will prevent certain psychological obstacles. How intelligent a woman is the mother? Why is she seeking dental care for her child? Why did she select you for her child's dentist? What dental experience has the child had? This information need not be in answer to direct questions, but an efficient assistant-secretary gathers the pieces of the story tactfully and relays them to the dentist.

Each new child patient, because his behavior pattern is unknown, places a direct challenge on the dentist. However, the dentist also must be aware of the behavior patterns of returning patients and be alert to deviations from the expected behavior of those whom he has known for many years. When he is aware of changes from the expected, it should be his desire and task to learn what lies behind them. Perhaps there has been a serious illness or death in the family. Perhaps the child has been ill or is ill at the present time. A new baby in the family may have created changes which affect this child. There may be school problems or too heavy a schedule of activities which add up to tensions. Any sensible mother will appreciate the difficulties of the dentist and will endeavor to help overcome them.

Dentistry cannot be done happily or satisfactorily for a child who is screaming or is generally noisy, nor for a child who is impudent, sullen, angry, resentful, whining or tearful. These are psychological blocks and behavior problems which confront every dentist who works for children. He must decide whether to overcome them and accomplish a worthwhile service or avoid them and permit the child to grow up without benefit of dental health service. Dentists who have a sincere appreciation of their professional responsibility, and a real interest in each patient, can overcome these blocks.

There can be no rule established for dealing with each specific behavior problem, but it is obvious that a child who persists in crying long and loud must have his mouth covered. This necessarily must precede any communication with him. The firmness with which this is done and the explanation given will depend entirely on the child's motive, size and other phases of his personality. A young, uneasy child can be handled very gently and told that the noise cannot continue as the work must proceed. The attitude of the dentist, his words, tone of voice and the kind firmness he exhibits afterwards are much more important than any disciplinary action he may have taken.

In operating for extremely young children, two years of age and under, noise and crying are inevitable. In handling such children the primary concern of the dentist should be preliminary planning. He should have his equipment completely ready and his plan of procedure clearly in mind. The appointment should be made for a time when he can proceed without interruption and when any disturbance will not distress others who may be in the office. Unscheduled emergencies may cause confusion and upset other children who must wait. A simple explanation to these children will arouse their sympathy,

allay their freight, and even be comforting to them.

Behavior problems of an impudent or resentful nature should be settled between the dentist and the child. Judgment must be exercised in deciding whether the situation is to be discussed with the parent. Children expect their parents to reprimand them but when the dentist copes successfully with the behavior problem and parental reprimand is not forthcoming, the dentist has made a friend.

DENTAL HEALTH EDUCATION OF PARENTS

The dental health education of the parents of child patients is extremely important as it enhances the parent's confidence in the dentist's ability and contributes immensely to the child's feeling of security. A parent needs specific education as to the child's present dental condition and to conditions that may exist in the foreseeable future. A detailed explanation to a parent of a child's dental condition demonstrates the completeness of the examination and soundness of the diagnosis.

The parent of the new patient should be informed about the general appearance of the child's mouth. Particular emphasis should be placed on existing conditions with relation to the child's age. Such information should be given simply and clearly. The parent also should be advised as to the nature of the day's operation, number and nature of the cavities, interpretation of roentgenograms, suggestions for improved oral hygiene, relationship of arches, and fees involved. The possible items of information to be furnished parents are innumerable. The parent's questions should be anticipated and answered before they are asked. It is wise at the end of the conversation to repeat instructions and to list them in 1,2,3, order for clarity and emphasis.

Parents are entitled to the opinion of the dentist regarding various treatments and professional products. In expressing such opinions the dentist should give the source of his information. He should distinguish between what is purely his personal opinion, what is professionally approved by the Association, and what is purely commercial claim.

Some parents can understand a surprising amount of scientific instruction. The level of teaching depends on the type of parent with whom the dentist deals. When the senior author of this article began the practice of pedodontics 25 years ago, parent education consisted mainly in giving advice regarding the advisability of "filling baby teeth," removing infection, maintaining good masticating function, and preventing pain. Today the level of parent education is much higher. Now, the junior author, dealing with many of the same families, discusses with parents such subjects as: degrees of caries susceptibility, types of cavities, preventive orthodontics, lactobacillus counts, caries control measures and parent cooperation. This change in subject matter indicates progress and proves the effectiveness of previous education in dental health.

Placing the parent in the background during the child's appointment period has a beneficial psychological effect on the child. It impresses him with his own importance as an individual and with the service being rendered. It encourages his cooperation and helps make him a better future patient. The time and attention of the dentist belong to the child. Conversation with the parent about the child's dental condition should be held later.

ABNORMAL HABITS

There is no doubt that many severe malocclusions are caused by persistent thumbsucking and finger-sucking, abnormal tongue movements, lip and cheek

biting and other unnatural pressure habits. The general practitioner and the orthodontist should recognize the existence of these habits and assist in their correction as they present certain physiological and psychological blocks in the treatment of the child. There is much confusion in the minds of parents, pediatricians, psychologists and others who deal with children as to how best to overcome these abnormal habits. Some even advocate that the habits be ignored in the hope that the child will not be permanently damaged and that he will outgrow the condition. Dentists certainly must point out the hazards involved and work with parents and others in their correction.

APPOINTMENT MANAGEMENT

One of the major difficulties encountered by dentists in working for children concerns the arrangement of appointments. It is recommended that men who do general practice reserve a certain part of each day or a certain day each week for child patients.

In our practice, which is limited to pedodontics and orthodontics, a detailed record is kept of each child including, age, family connections and dental history. This record aids in determining what type of appointment each child needs. Even so, it is difficult to plan consistently in order to reduce confusion and mental strain to a minimum.

Weekday mornings are reserved for very young children, older children with behavior problems, and physically handicapped children. For the sake of the operator, each morning is planned so that it does not include too many children of one type. New patients are not scheduled simultaneously. Children are influenced by the behavior of their contemporaries, thus they are either encouraged or frightened.

Early afternoon hours are reserved for 10 and 11 year old patients except for those children with very good behavior. Late afternoon appointments are reserved for patients whose behavior is entirely dependable. Long orthodontic appointments for the construction and insertion of appliances and for the examination of new patients are made during weekday mornings. The afternoons are reserved for shorter adjustment appointments.

THE PROBLEM OF SCHOOL ABSENCES

The majority of parents, with the minimum amount of explanation in regard to dental appointments during school hours, are very cooperative. The dentist need not be belligerent in discussing this problem with parents because he, too, is interested in the child's happy relationships at school. It is believed, however, that having a child available at the time of day when the dentist can give his best and can properly expect the same from his patient is more important than a few hours' or a day's absence from school.

Parents must be made to realize that a day at school is fatiguing for any child, especially a young child. They also must be made to realize that a dental appointment is fatiguing and enervating. A difficult dental appointment added to a long and perhaps difficult day at school is more than some children can stand gracefully. Parents also must realize that the burden of dentistry for children is carried by a comparatively few men and that Saturdays and late afternoons do not include sufficient hours to serve all children in the community. Furthermore most children resent the taking of their play time and holidays for dental appointments, thus creating another management problem.

The dentist who conscientiously tries to operate for children should insist on the privilege of making appointments for child patients during school hours. A great deal of organized action has been taken by the American Society of Den-

tistry for Children and by various state and local dental societies, in meeting this problem. Of late years, the majority of school boards have been cooperative and understanding in this respect.

CHILDREN WITH PHYSICAL AND MENTAL HANDICAPS

So far this paper has dealt only with the psychological blocks confronted by the dentist in dealing with patients and parents who are physically and mentally normal. In addition to these patients, however, the dentist must care for his share of children who are physically and mentally handicapped.

These patients present the same problems presented by normal children. The proper appointments must be made, parents must be educated and absences from therapy schools must be arranged. In addition to these routine problems, operating for the handicapped child presents other difficulties. Dental procedures must be carried out in the face of the physiological handicap. Relations will have to be established with other professionally trained individuals, such as neurologists, plastic surgeons, physical therapists and speech specialists.

Speech Difficulties • The small dental patient suffering from a speech defect should not be annoyed by being asked to repeat what he said. The dentist should respond to his statements, even though he does not understand every word. When improvement in speech occurs the child should be praised.

Speech difficulties should be pointed out to parents who are not aware of them, or who think they are insignificant or cute. The dentist should help the parents evaluate the seriousness of such defects and refer the child to a specialist who can accurately analyze the problem and guide treatment.

Deafness • Deaf children generally are satisfactory patients although their management frequently is more complicated than that of the child with normal hearing. Close cooperation between the dentist and the parent is essential in handling these children.

The dentist must be interested in, and must acquaint himself with, the general activities of this type of patient. He should know how well the child does in school and what special instruction he receives in speech and related courses.

The dentist who is successful in operating for children must maintain and express his interest in the whole child. This attitude is vitally important in dealing with children having hearing and speech difficulties. This same interest will aid in overcoming psychological obstacles created by polio, birthmarks, deformities of hands and feet and other physical handicaps.

The dental treatment for children suffering from cerebral palsy, cleft palate and cleft lip, and mental deficiencies requires considerably more planning and study and causes much greater mental strain.

Cerebral Palsy • Physicians attending children suffering from cerebral palsy appreciate the cooperation of a sympathetic and competent dentist. Children afflicted with cerebral palsy usually are difficult dental patients. A physician can help by prescribing premedication sedation, estimating mentality rating and furnishing information regarding parental cooperation. The parents must be informed of the difficulties involved in treatment and the limited results that frequently may be expected. Despite the difficulty of handling such patients and the knowledge that the service may not be wholly successful it is the responsibility of the dentist to provide them with the best dental care possible.

Cleft Palate • Too frequently a child afflicted with a cleft palate or cleft lip is denied adequate dental care because the dentist is frightened by the deformity.

He is often blind to the fact that some of the teeth have erupted normally and need restorations and caries preventive measures. He may have to contend with serious gagging and hygiene difficulties; he may have to struggle with severe psychological difficulties. These problems, however, are not insurmountable. By timely consultation with the plastic surgeon and with the orthodontist, it is often possible to achieve very gratifying results.

SUMMARY

The dental profession must strive for even greater improvements than those which have taken place within the last 25 years—improvements in the dental educator's attitude toward pedodontics, and improvement in the public's appreciation for children's dental service.

To practice dentistry for children successfully the dentist must consider and overcome certain psychological and physiological blocks. Factors having to do with the prevention and interception of routine behavior problems include: (1) undivided attention for the child patient during an appointment; (2) adjustments which must be made by the dentist to each child; and (3) problems encountered in dealing with the new child patient.

The dentist's relations with parents must be satisfactory in order to render proper service to the child. A parent must be made to understand the dental needs of the child, he must learn to appreciate adequate care, and he must cooperate in carrying out the dentist's recommendations.

The dentist has a very definite responsibility in dealing with abnormal habits found in child patients.

Careful consideration must be given the arrangement of appointments and the problem of school absences.

The dentist who works for children is urged to assume his share of patients who have specific physical handicaps, such as speech impediment, deafness, cleft palate, cleft lip and cerebral palsy.

478 Peachtree Street

Stability of Scientific Language • The background of medical English makes a strong story. It is utterly at variance with the usual ancestry of a language in that it tells the story of a science and not a people. The inevitable dialectic decay suffers a curious check. It is in part at least a language spoken only by the scholar, and his ingrained respect for antiquity and authority constantly combats the changes which occur in speech from generation to generation. Ordinary speech is controlled from below; the masses make and remake it in defiance of scholars who reluctantly have to accept the speech of the populace as their own, often after considerable delay attributable to conservatism. With the scientist, however, the written word rules the spoken word, and regular regeneration of older changing words is a steady process. *Edmund Andrews, A history of scientific English, p. 58.*

A treatment for excessive occlusal trauma or bruxism

William Brown Ingersoll, D.D.S., and*
Edwin G. Kerens,† D.D.S., Washington, D. C.

Many years ago attention was called to bruxism and its seriousness was emphasized by researchers in the field. The condition is far more prevalent than many realize, and research is being carried on constantly to determine the extent of this disorder. Much valuable new data are available as a result of findings relating to service men and women both in and out of veterans hospitals.

Hundreds of veterans have been observed and each case provides a definite history of some form of bruxism. The origin of the condition can be traced to widely different causes from battle fatigue to home surroundings, from marital troubles to rehabilitation—but symptoms in the oral cavity are the same in all of them.

Unfortunately, the diagnoses are as varied as the origin. These conditions are being diagnosed as Vincent's infection, Vincent's angina, trench mouth, gingivitis —all of the common disorders—and are being treated on the supposition that destruction of the organisms will clear up the disorder. We have demonstrated, as have many others, that this theory of medicinal application and oral hygiene is unsuccessful. The patient shown in Figure 1 was treated for periodic gingival disorders. The condition recurred. Careful checking of his history revealed bruxism to be the cause of the disturbances.

In a significant number of cases all inflammatory gingival areas have been removed, but there is a recurrence in a short time.

Conservative curettage, with interdental stimulation and continual polishing of root surfaces as applied to all gingival inflammatory cases, is of little help when the patient continues a persistent traumatizing of tissues and bone.

OCCLUSAL TRAUMA

Occlusal trauma is defined as a force in excess of that which can be borne without injury by the tissues of the periodontium. However, it is the type of force applied rather than the magnitude of the force which is the determining factor. The tooth supporting apparatus is made up in such a way that vertical force is easily assimilated; this is not true of force applied in a lateral direction. The investing tissues can tolerate lateral force only to a limited extent, since there is a relatively small number of principal fibers of the periodontal membrane designed to resist lateral force. As long as this force is balanced by the resistive factors of the patient, no damage results; in many in-

*Professor of periodontia, Georgetown University School of Dentistry, Washington, D. C.

†Clinical associate professor of prosthetics, Georgetown University School of Dentistry, and chief of Dental Service, Mt. Alto Veterans Administration Hospital, Washington, D.C.

stances the tissues build up resistance to the force.

At a rest position the teeth are apart and no force is applied; therefore, occlusal trauma can result only if the teeth are occluded at times other than during mastication. The small time element of mastication and the cushion effect of food between the teeth cannot account for the production of trauma. Habits of clenching, bruxism and setting of the mandible in lateral excursions are agents in bringing about trauma. The force produced by these habits is relatively great and prolonged.

Fig. 1 • Patient was treated for periodic gingival disturbances. Note loss of gingiva in upper left posterior region. Condition later diagnosed as bruxism

BRUXISM

The habit of grinding the teeth during sleep, or during the daytime by those accustomed to rubbing their teeth firmly together during mental concentration or nervousness may cause irreparable damage to the periodontal tissues. Not only may the teeth wear down so that the contact points between them are lost, permitting food impaction, but facets worn in the teeth may cause a tripping in the excursions of the mandible and thus bring about an overloading of the tissues of the supporting structures. The teeth may also move from their position in the arch.

TREATMENT OF BRUXISM

The clenching or grinding of teeth as a habit during the day or night is often an etiologic factor in the production of periodontal destruction. Occlusal bruxism is generally acknowledged to be caused by a neurosis in the form of stress, either physical or mental. In many cases a mild form of neurasthenia may be present. Patients who have the habit may be unaware of it; however, the history of waking in the morning with a slight stiffness in the masseter muscles or soreness in the teeth is indicative of this habit. Autosuggestion will in most cases stop the grinding during waking hours, and sometimes during sleep. It may be necessary, however, to use auxiliary means to eradicate the habit.

Acrylic, rubber and metal appliances placed in the mouths are usually expelled, broken or ground to pieces. After some experimentation with Vinolin we have produced a mold to conform with both upper and lower natural teeth. This form when worn at night has produced amazingly good results. Its construction is simple and accurate.

CONSTRUCTION OF SPLINT

Selection of Material • The first problem encountered in the making of a splint designed for relief of trauma was the selection of a material which, by its own physical properties, would not further traumatize.

Splints made of metal or ordinary denture acrylic or vulcanite, while allowing an even distribution of force over the area covered, were found to cause trauma around the supporting tissues of the teeth opposing the splint. For example:

1. Soft rubber splints are acceptable so far as the trauma factor is concerned, but are disagreeable to patients in a short time because of taste and odor.

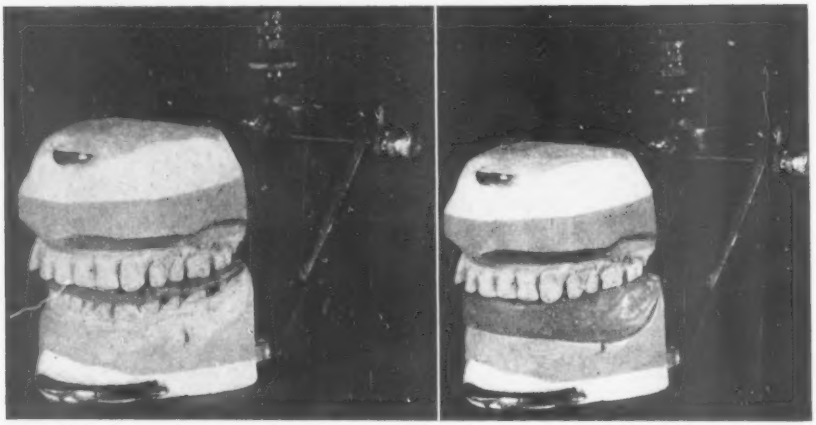


Fig. 2 • Left: Splint covering occlusal and incisal third of teeth. Right: Splint covering teeth and gum surfaces as far as the mucobuccal fold

2. The "soft" acrylic materials, while not displeasing to the patient and soft enough to reduce trauma, are actually too soft when in use, with the result that the patient easily chews through the splint or actually cuts it to pieces.

3. A material has been found which so far seems ideal for the purpose. It is a vinyl resin (Vinolin). This material, which is used cosmetically for the fabrication of artifical hands, noses, ears, and so forth, is also sturdy enough to resist the heavy subconscious biting pressure so characteristic of the patients for whom this treatment is designed. Also, it has a pleasing pink color, is tasteless and odorless in the mouth, durable and yet soft enough to cushion and distribute chewing force. Up to the present time none of the splints made of this material have been damaged by the forces to which they have been subjected.

Splint Design • It was decided that the splints would be placed over the lower teeth rather than the upper teeth in order to take advantage of gravity as a retentive agent.

The first splints covered only the occlusal or incisal third of the teeth on the supposition that the least amount of material placed in the patient's mouth would be the most tolerable (Fig. 2, left). This design was discarded as impractical because it afforded only slight means of retention.

The use of clasps or other retainers was avoided since pressures exerted on the splint would mainly pass on to the clasped teeth and trauma would center around them.

Another type of design was used carrying the splint as far as the gingiva. This added greatly to the retention but had the disadvantage of being much more uncomfortable to the patient because the lingual and buccal flanges were unfortunately terminated at the point where the tongue, lips and cheek came most easily in contact with them.

In a third design the flanges were extended buccally to the mucobuccal fold and lingually to correspond to the outline limit of the average full lower denture (Fig. 2, right). This design was more successful because the edges did not irri-

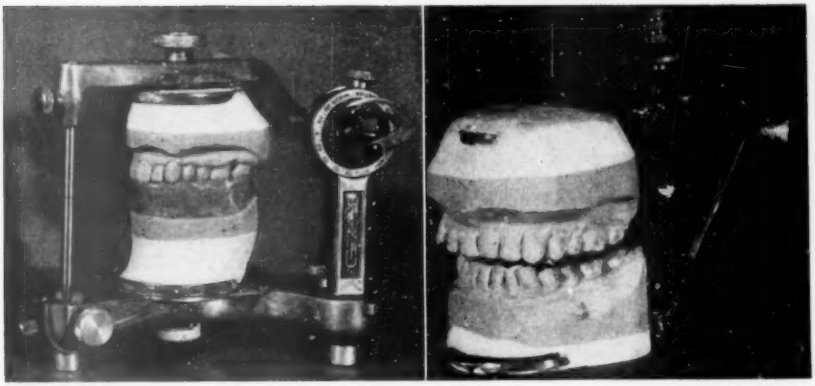


Fig. 3 • Left: Splint on anatomical articulator following face-bow mounting. Right: Space between models after wax bite has been removed

tate the tongue and cheeks, and a great amount of retention was afforded.

Construction Technic • When the usual mouth preparations are completed impressions are made of the upper and lower arches using any reliable elastic impression materials. The tray flanges should be long enough to extend buccally as far as the mucobuccal fold and lingually as far as the normal outline of the average full lower denture flange.

Stone models are poured immediately. It is recommended that a wax bite be taken in the mouth at this time. In taking this bite some form of stop should be incorporated in it to prevent the patient from biting entirely through and to establish a degree of opening for the splint. For this purpose two thicknesses of baseplate material molded over the posterior teeth and embedded in the wax bite will furnish the desired opening. The resulting relationship established between the models is less likely to create a traumatic bite in the posterior region than would the relationship obtained by opening the articulator 3 or 4 mm. Since the entire concept of splint use is based on reduction of trauma it would seem best to eliminate possible traumatic conditions whenever possible during the splint construction.

A face-bow technic combined with an anatomical articulator is used to advantage (Fig. 3, left). The models should be sealed in the wax bite and mounted on the articulator.

When the wax bite is removed a space of 3 or 4 mm. between the models will be disclosed (Fig. 3, right). This space will be used for the splint.

Processing of Splint • The steps in the waxing and processing of the splint are as follows: The outline of the splint is drawn on the lower model with a pencil. This outline should extend as far as the sulcus of the mucobuccal fold and lingually as far as the outline of a full lower denture flange. It should extend posteriorly 2 or 3 mm. beyond the second molar region or third molar region when these teeth are present.

A sheet of pink baseplate wax is warmed, folded lengthwise twice and molded down well over the occlusal and incisal of the teeth as far as the pencilled outline.

The articulator is closed and grasped

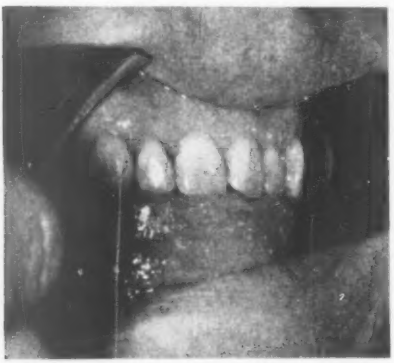


Fig. 4 • Splint inserted in patient's mouth

firmly, and forced through lateral and protrusive movements, creating pathways for the upper teeth with the minimum of resistance and eventual trauma. At this time it is wise to make sure that the splint surface is broad enough to allow for support for the teeth in all movements without the possibility of their dropping off the edges. This occurrence is not likely, however, since patients usually confine their grinding activities to a small area.

Excess wax on the occlusal surface is removed and the buccal and labial flanges smoothed. As a guide, it is suggested that the flanges be about 3 mm. thick, tapering to about 1 mm. at the periphery. This thickness will vary with any special condition encountered. No attempt is made to block out undercuts since the finished material is supple enough to spring over the most severe undercuts and the retention afforded is highly desirable.

The splint when completely waxed, having an external appearance similar to a lower denture wax biterim, is invested in a denture flask in the same manner as a lower denture. The wax is boiled out and a reliable separation medium applied. The vinyl resin is then put into the flask with a spatula on the model side of the flask and in the negative portion as well. It is best to place sufficient resin in the flask to make it slightly overfull. The flask is closed with a press, forcing out the excess. The flask is then placed in a vulcanizer and the temperature raised as fast as possible to 315°F., held for five minutes and the steam released. The flask may be cooled on the bench or in cold water. When the flask is opened the splint can easily be removed from the model, the excess trimmed with scissors, and when buffed with a pumice brush wheel, it is ready for use.

This material may be cured in the same manner as acrylic, but the manufacturers suggest that both halves of the flask be poured in metal. It is possible that there is a slight darkening of shade when the vulcanizing method is used, but for this particular purpose, shade is a secondary factor. The use of metal would of course require that the splint be carved in plaster or investment material rather than in wax, thereby adding to the difficulty of manufacture.

When finished the splint is inserted over the lower teeth (Fig. 4), and the patient is instructed to close his jaws and move the mandible laterally and protrusively. Interference can be eliminated with a large vulcanite bur and excess at the periphery can be reduced with scissors. It is then buffed with pumice, and the patient is released with instructions to wear the splint at night or in the daytime if not in public view.

The splint should be cleaned with a brush before and after use in the same manner as a denture. The splint area covering the lingual and buccal gum surfaces is actually tissue-stimulating because of the massaging action of the splint under stress.

The rest space is not seriously encroached upon, since considerable cusp height has been lost beforehand, and the splint thickness is not appreciably inconvenient.

Stomatitis and gingivitis in the adolescent and preadolescent

Donald A. Kerr, D.D.S., M.S., Ann Arbor, Mich.

There is a great difference in the observations of various investigators regarding the prevalence of gingivitis in children. In postwar Italy, Schour and Massler[1] reported a prevalence of 40 per cent in the 6 to 10 year age group. Day and Shourie[2] reported a prevalence of as high as 99.4 per cent in the lower social level Indian children. However, this group included individuals up to 20 years of age, who hardly can be considered children. The statistical data are of little significance because of the types of groups studied. A report[3] of gingivitis in London school children from 2 to 15 years of age indicates that there is an increase in prevalence with age, and at the age of 14, about 47 per cent had gingivitis, with about 31 per cent having slight evidence, and about 22 per cent having moderate to severe gingivitis. Zappler and Person,[4] in a study of periodontal disease in children, concluded:

> Consideration of such data indicates the necessity for a wide geographical survey of the incidence of periodontal disease in children. It is evident that while serious periodontal disease is not very common in this section of the United States, other areas throughout the world face a tremendous periodontal problem insofar as their children are concerned. . . .

It thus is obvious that the prevalence varies from one part of the world to another, but a consideration of only the United States indicates that the prevalence of gingivitis in children is not high. If one considers simple marginal gingivitis and disregards the so-called eruption gingivitis and specific forms of gingivitis, then the incidence in children is low.

Gingivitis of childhood is usually of a specific type rather than the nonspecific type which is most common in adults. Simple gingivitis may be detected in the preadolescent and adolescent when there is extensive caries with exposure of pulps, and normal mastication of food and cleansing of the teeth is prevented. Mouth breathing is also a significant cause of gingivitis of this type. In most children, however, the mouth is self-cleansing and free of accretions, and so simple gingivitis is not produced.

The specific types of gingivitis most frequently encountered are eruption gingivitis, pubertal gingivitis, and gingivitis caused by diphenylhydantoin sodium.

Presented before the Section on Pedodontics and Oral Hygiene, ninety-first annual session of the American Dental Association, Atlantic City, November 2, 1950.

Associate professor of dentistry (histopathology and periodontics), University of Michigan, School of Dentistry.

1. Schour, I., and Massler, M. Gingival disease in post-war Italy (1945). I. Prevalence of gingivitis in various age groups. J.A.D.A. 35:475 (Oct. 1) 1947.

2. Day, C. D. M., and Shourie, K. L. Hypertrophic gingivitis in Indian children and adolescents. Indian J. M. Research 35:261 (Oct.) 1947.

3. Medical Research Council, Privy Council. Reports of the committee for investigation of dental disease. Special report series No. 97. London, 1925.

4. Zappler, Sylvia, and Person, Philip. The incidence of periodontal disease in children. New York J. Den. 18:300 (Oct.) 1948.

Eruption gingivitis is marginal in type and manifests itself around teeth in the process of eruption. The heavy gingival margin and partly erupted tooth prevent the normal excursion of food, and food debris is entrapped beneath the margin around the tooth. There is also impingement of food against the gingival margin which produces marginal irritation. This type of gingivitis usually subsides when the teeth are fully erupted. Treatment of this type of gingivitis is by special brushing procedures which remove the impacted food and stimulate the gingival tissue.

A similar type of marginal gingivitis is seen in patients who fail to take proper care of the mouth while wearing orthodontic appliances.

A form of hyperplastic gingivitis occurs in children at the age of puberty because of a disturbed hormonal balance. At puberty, production of gonadal hormones which are antagonistic to the anterior pituitary growth hormone occurs, and this antagonism may be responsible for the imbalance.

PUBERTAL GINGIVITIS

The child with pubertal gingivitis exhibits an increase in bulk of the gingival tissue. The papillae are enlarged and more than fill the interdental area. The gingiva is soft and bleeds freely. It is hyperemic and is accompanied by stasis, producing a bluish cyanotic color. There may be localized areas of deepened color due to hemorrhage into the tissue. The mouth is unhygienic because of the difficulty of cleansing it and the patient's irresponsibility. Frequently the skin is roughened and there is a moderate amount of acne.

The treatment of this form of gingivitis is sometimes difficult because of the prolonged effect of the systemic factor and the failure of the irresponsible adolescent to cooperate in maintaining an adequate oral hygiene. The treatment is entirely local and consists of producing a good oral hygiene by cleaning and polishing the teeth. The tooth surfaces should be highly polished to prevent food retention and the patient must be taught to cleanse his mouth adequately and must do it efficiently. With local treatment of this type, the gingivitis is alleviated, but there may be some residual changes for varying periods of time because of the hormonal stimulation. With adjustment of the hormonal imbalance, the tissues return to normal. The return to normalcy may take place in a few months or may take as long as two years. Gingivectomy usually is not indicated. Hormonal therapy has been used by some clinicians, but is contraindicated at present because of lack of knowledge of the specific endocrine substances involved.

The pathologic changes in pubertal gingivitis are similar to those observed in pregnancy gingivitis. There is a proliferation of the endothelium with many new-formed, delicate vessels. This increase in vascularity is responsible for the color change and increased bulk of the gingiva. There are heavy inflammatory infiltrations in the subpapillary region especially rich in plasma cells. The epithelium is hyperplastic and there are often microscopic areas of ulceration. Occasionally granuloma pyogenicum appears on the gingiva and is of the same significance as granuloma gravidarum in the gingivitis of pregnancy.

PATHOLOGY OF GINGIVITIS CAUSED BY DIPHENYLHYDANTOIN SODIUM

Gingivitis caused by diphenylhydantoin sodium is a hyperplastic condition associated with the administration of this drug for the treatment of epilepsy and related nervous disorders. It appears not infrequently in the adolescent and postadolescent.

The clinical appearance is somewhat typical in the cases which do not have a superimposed inflammatory reaction.

The gingiva is increased in bulk, especially in the interdental regions, so that the papillae are bulbous. The hyperplasia is not limited to the free gingival tissue but extends onto the attached gingiva. The labial and lingual gingiva are also increased in bulk. The tissue is firm and pale pink. In severe cases the surface has a slight papillomatous or verrucous surface. There is no increase in tenderness or bleeding. The process involves the entire gingiva but may be more noticeable in some locations than in others. When simple marginal gingivitis is superimposed, the tissues are more irregular and nodular in character. There is a decrease in density, an intensification of color, and an increased tendency to hemorrhage. The hypertrophy is intensified by the inflammatory process and is more nodular. The proportional involvement between free gingiva and attached gingiva is altered because the inflammatory process is limited to the free gingiva.

The pathologic changes are those of hyperplasia. There is an increase in the subpapillary connective tissue and heavy collagenous fibers are produced. The epithelium is increased in thickness with the rete pegs widened and passing deeply into the tissue. There is no increase in wandering cells. When the condition is complicated by simple gingivitis, the inflammatory infiltrations are numerous. There is some increased vascularity, especially in areas of microscopic ulceration.

This condition must be differentiated from congenital fibromatosis of the gingiva which has a similar clinical and pathologic appearance. The change in congenital fibromatosis is more generalized and progresses to a more severe degree.

TREATMENT OF GINGIVITIS CAUSED BY DIPHENYLHYDANTOIN

Gingivitis caused by diphenylhydantoin is treated best by conservative procedures. Establishment of good oral hygiene and removal of all sources of local irritation, such as may be produced by sharp margins of restorations, impingement on the gingiva, and food impaction, constitutes the treatment. An intensive program of home care is necessary to prevent irritation from calculus and food debris. Adequate stimulation of the gingiva by brushing and rubber stimulator is helpful. Gingivectomy should be utilized only if there is a direct impingement of the teeth against the hyperplastic gingiva. By these thorough but conservative measures the hyperplasia can be controlled and, in most cases, remarkably reduced, even though the dosage of the drug is not reduced.

HERPETIC GINGIVOSTOMATITIS

Herpetic gingivostomatitis has been called acute infectious stomatitis, aphthous stomatitis, and acute ulcerative stomatitis when it has involved several regions of the oral cavity and has been attended by general symptoms. Individual lesions have been called herpes labialis, aphthous ulcer, fever blister, cold sore and canker sore. That these lesions are produced by the herpes simplex virus has been proved by numerous investigators. Grüter[5] inoculated the scarified cornea of a rabbit's eye with the fluid from the vesicular lesions and produced the disease. He transmitted the disease from one animal to another by inoculating the scarified cornea with the exudate from the eyes of other rabbits.

Dodd, Buddingh, and Johnston[6] tested 28 instances of gingivostomatitis for the virus of herpes simplex and were able to recover it from the mouths of 27 patients. This finding was highly sug-

5. Grüter, W. Experimentelle und klinische Untersuchungen über den sogenannten Herpes corneae. Klinische Monatsblätter f. Augenheilkunde 65:398, 1920.

6. Dodd, Katharine; Buddingh, John, and Johnston, Leland. Herpetic stomatitis: an enanthem. Am. J. Dis. Child. 58:907 (Oct.) 1939.

gestive but did not prove the etiology positively because the virus can be isolated from the mouths of persons with no clinical symptoms. Burnet and Williams[7] demonstrated the presence of herpes simplex virus in the mouths of their patients and observed the development of herpes-neutralizing antibodies in the patients' blood. Scott, Steigman, and Convey[8] isolated the virus by corneal inoculation in 17 of 21 cases tested. Nineteen of the 21 were tested and found positive for neutralizing antibodies during the convalescent stage of the disease, although a large percentage exhibited no antibodies in the early phase of the disease. The evidence of these and other workers indicates that the herpes simplex virus is the etiologic factor in herpetic gingivostomatitis.

INCIDENCE AND COMMUNICABILITY

The disease usually occurs in young children, but occasionally is observed in babies under one year of age and not infrequently in young people in the late teens. It is uncommon in adult life. In Scott, Steigman, and Convey's series the age range was from 1 year to 14 years, with the exception of one instance which appeared in a woman 24 years old. Forty per cent of their cases appeared in patients under 3 years of age and 70 per cent in those under 6 years of age. The gingivitis occurred in both sexes with equal frequency and there was no evidence of racial susceptibility.

There is suggestive evidence that the disease is a highly communicable one. Scott, Steigman, and Convey report a history of contact in almost 50 per cent of their series of cases. The familial epidemics, of which there were three in their series, are evidence of the communicability of the disease. The epidemics of Vincent's infection often reported in schools sometimes prove, on careful study, to be herpetic stomatitis. Frequently a child in school complains of a sore mouth, and a tentative diagnosis of Vincent's infection is made and smears taken. The smear is positive for Vincent's organisms and the tentative diagnosis is confirmed. In from three to nine days, which appears to be the incubation period for herpes simplex, several children in the room have similar symptoms and are likewise diagnosed as suffering from Vincent's infection. Thus the report of an epidemic of Vincent's infection is made, which in reality is an epidemic of primary herpetic stomatitis. Cases of primary herpetic stomatitis should be treated in isolation as are other communicable diseases.

CLINICAL SIGNS AND SYMPTOMS

Herpetic stomatitis should be divided into primary herpetic gingivostomatitis and recurrent herpetic stomatitis because of the difference in clinical appearance and treatment and the chronic character of the latter.

Primary herpetic gingivostomatitis is an acute systemic infection produced by the initial infection with the herpes virus. Because the individual has no antibody defense, the disease is of a severe generalized nature. The initial infection not infrequently is preceded by some disease process such as an upper respiratory infection, infectious mononucleosis, or a gastrointestinal upset, which lowers the customary resistance of the individual to the virus. As the onset of the disease is frequently insidious and the early symptoms nonspecific, they are not given consideration. The infant cries without apparent reason, is irritable, fretful, drools excessively, and frequently refuses food and fluids. Older children are irritable, fretful, quarrelsome, lack normal interest

7. Burnet, F. M., and Williams, S. W. Herpes simplex: new point of view. M. J. Australia 1:637 (April 29) 1939.

8. Scott, T. F.; Steigman, A. J., and Convey, J. H. Acute infectious gingivostomatitis. J.A.M.A. 117:999 (Sept. 20) 1941.

in play, are lethargic, and complain of headache, soreness in neck, and pain on swallowing. Within a day or two the articulate patients complain of a sore mouth following the appearance of ulcers. Physical findings previous to the appearance of the characteristic ulcers are a submaxillary and submental lymphadenopathy and fever ranging from 99° to 105° F., which lasts for three to five days but usually subsides rapidly following the appearance of the oral eruptions. In some patients the symptoms are complicated further by acidosis and dehydration. After the prodromal stage, the typical oral manifestations occur and are responsible for the seeking of aid by the patient.

The gingival tissues are swollen, spongy, intensely red and tender. Frequently there is tendency to bleed. The tongue, buccal mucosa, palate and pharynx all are involved to a variable degree, depending upon the severity of the disease. Vesicles of varying size appear and rupture rapidly, forming a discrete shallow ulcer, the border of which is undermined and ragged. The base of the ulcer, at first clean, is covered rapidly by a greyish or yellowish pseudomembrane. The inflammatory reaction at the border of the ulcer is considerable and produces an intense red ring around the ulcer, frequently termed an "inflammatory halo." The ulcer also rapidly becomes intensely painful. When several vesicles appear in a small area, they may coalesce and form a large irregular ulcer. The ulcers are most common on the tongue, buccal mucosa, and lips, but may involve the gingiva. The pharynx also is involved in severe cases, and in the extreme cases larynx, trachea, esophagus and nasal mucosa may be involved.

The typical severe inflammatory response of the mucosa always is present, but the ulcers may not appear in all cases. Fetor oris is noted in all cases of primary herpetic gingivostomatitis.

THE COURSE OF PRIMARY HERPETIC GINGIVOSTOMATITIS

The prodromal phase, which is characterized by fever and lymphadenopathy, is present for 24 to 48 hours previous to the development of the typical vesicular lesions. Numerous vesicles are found simultaneously and sometimes there are several "crops" which appear at 12-hour to 24-hour intervals. The vesicles are transient and in 2 to 12 hours rupture, producing the typical shallow, painful ulcer with its characteristic inflammatory halo. The fever usually subsides after the onset of the oral symptoms. The patient, during this stage, frequently develops an acidosis and becomes dehydrated. The ulcers persist for five to ten days and heal spontaneously without scarring. During this period the immune antibodies appear in the sera and persist for some time. The swelling of the gingiva and the lymphadenopathy are the last symptoms to disappear. The lymphadenopathy may persist for several weeks. One attack usually produces some degree of immunity so that a second generalized episode rarely occurs. The disease varies in severity and even may cause death. It is most severe in young infants and it is this age group in which death may occur. Several patients in the University of Michigan department of pediatrics have died of the disease.

PATHOLOGY

The specific discrete lesions start as intraepithelial vesicles which quickly rupture and produce shallow ulcers. The vesicle is filled with tissue fluid which contains degenerating cells and the herpes virus. The vesicle results from the intracellular edema and hydropic degeneration of the epithelial cells. These changes lead to the so-called reticular and balloon cell degeneration. In the late stages some polymorphonuclear cells appear in the corium and the vesicular

fluid. Occasional inclusion bodies are found in the epithelial cells at the periphery or base of the vesicle. When the vesicle ruptures, a typical shallow ulcer is produced. The ulcer immediately becomes secondarily infected. The exudate produced is rich in fibrin, in which are trapped numerous polymorphonuclear cells and cellular debris. There is slight simple necrosis of the submucosa, and the deeper tissues become heavily infiltrated with leukocytes. After the lesion has been present for a few days there is evidence of epithelial regeneration at the border. The lesion continues to heal rapidly and without scarring.

LABORATORY FINDINGS

Bacteriologic smears demonstrate Vincent's organisms in a large number of cases. The herpes simplex virus can be demonstrated in almost every case. Early in the disease, immune antibodies are absent but occur in quantity in the convalescent patient.

DIFFERENTIAL DIAGNOSIS

Herpetic stomatitis must be differentiated from Vincent's infection, lesions of exanthematous diseases, and chemical stomatitis.

The oral tissues may be predisposed to Vincent's infection by systemic disease. It is accompanied by fever and lymphadenopathy and is characterized by soreness, swelling and bleeding of the gums, and therefore simulates a primary herpetic gingivostomatitis. The fever in Vincent's infection usually does not precede the soreness of the oral cavity. Necrosis of the interdental tissue always characterizes Vincent's infection, but does not occur in herpetic gingivostomatitis. This absence of interdental necrosis is the most important point of differential diagnosis.

The lesions of the exanthemas usually are localized in the mucosa without the associated gingival change seen in herpetic gingivostomatitis. They may ulcerate but usually do not have the characteristic inflammatory halo.

Chemical stomatitis, such as that produced by aspirin or toothache drops, usually is localized in the portion of the mucosa contacted by the chemical irritant. Necrosis, if present, usually is localized in a single but larger region than herpetic gingivostomatitis and lacks the characteristic peripheral inflammatory reaction characteristic of the herpetic ulcer.

TREATMENT

Primary herpetic gingivostomatitis, because it is a communicable infection of self-limited type, does not respond to therapeutic measures of an abortive or curative character. The disease has a certain pattern of prodromal, active, and convalescent phases which is unalterable. Treatment then must be supportive and symptomatic.

The use of warm alkaline lavage is most satisfactory for the relief of the acute symptoms. One teaspoonful of baking soda and one-half teaspoonful of table salt dissolved in one quart of water heated to a temperature which can be held in the mouth comfortably is most satisfactory. The mouth is irrigated with one quart of the solution each hour for several hours until the patient is reasonably comfortable; then the interval is extended to four hours. The heat is effective in relieving symptoms and the frequent lavage keeps the mouth free of debris. Secondary infection may be reduced by swabbing the mucosal surfaces with 2 per cent acriflavine 1:500, nitromersol, or mercocresols. Antiobiotic troches reduce secondary infection but are not as effective in relief of the symptoms as the frequent warm lavage. An antipyretic such as aspirin is used to reduce the temperature. Forced fluids are desirable to prevent acidosis and dehydration. In severely dehydrated patients,

parenteral fluids may be necessary. This treatment is essential, especially in very young patients in whom the process is severe and the forcing of fluids impossible. Hospitalization is essential in such circumstances. Aureomycin, in adequate doses administered at the onset of the disease, may reduce its duration by preventing subsequent crops of lesions from appearing. In those instances in which the vesicles appear one time only, the course of the disease will not be much affected.

RECURRENT OR SECONDARY HERPETIC STOMATITIS

The recurrent form of the disease is seen in older patients who have been infected previously by the herpes virus and who have developed some humoral resistance. The patient may or may not give a history of a previous attack of a primary herpetic gingivostomatitis.

The etiology is the same as in the primary form of the disease and has been demonstrated by rabbit cornea inoculations. The virus, once introduced into the body, is residual intracellularly and becomes activated with lowering of the resistance of the tissue. Because of the intracellular habitat the lesions frequently recur repeatedly in the same location. The factors which lower the tissue resistance are upper respiratory infection; fever, even though artificially produced; allergy, especially of the gastrointestinal type; exposure to sunlight; and trauma of even slight degree.

CLINICAL SIGNS AND SYMPTOMS

General symptoms do not attend recurrent herpetic stomatitis except as predisposing factors. The first symptom usually is a sensation of swelling and burning in a localized region which is followed shortly by the development of a vesicle that ruptures quickly and produces a shallow ulcer. The ulcer is of the same type as that seen in the primary phase of herpes but is frequently of greater size. The ulcers occur most often on the lip, buccal mucosa, tongue, and with less frequency on the palate. Special terms, such as "fissuratum" and "labialis" have been used to designate their location.

The ulcer rapidly develops a membranous base and becomes painful. It has the characteristic inflammatory halo about it. The ulcer shows a tendency for healing and usually heals in from 5 to 10 days without scarring, even though repeated lesions occur in approximately the same location. During the period of active ulceration, sialorrhea and some lymphadenopathy may accompany the lesions. Like the primary lesions, these are difficult to check and, in spite of therapy, run a specific course.

TREATMENT

Many forms of treatment and prevention have been suggested for secondary herpetic stomatitis. Local treatment of the ulcers with caustics, such as silver nitrate, phenol, and trichloracetic acid has been used to reduce the associated pain. The use of penicillin and aureomycin troches to reduce secondary infection, and thus pain, is recommended by many. Hot salt and soda mouthwash, described under the treatment of the primary phase, also is effective.

There have been many treatments suggested for the prevention of this condition, all of which have merit in some cases but are not uniformly effective. Woodburne[9] has suggested the use of smallpox vaccination as a preventive treatment and appears to have been successful in some cases. At the University of Michigan more success has resulted from repeated injections of

9. Woodburne, A. R. Herpetic stomatitis. Arch. Dermat. & Syph. 43:543 (March) 1941.

smallpox vaccine in increasing doses. After the patient has been vaccinated and time has been allowed for the reaction to subside, then one-half capillary tube of vaccine is dissolved in 0.1 cc. of normal saline and injected intradermally. The quantity is increased to one tube the second week, with an increase of one tube for each succeeding week until six injections have been given. Fisher[10] has recommended the use of snake venom to prevent recurrence. Aureomycin also has been used. Aureomycin does not provide immunity, but, while the drug is being administered, it is somewhat effective. Those cases resulting from an allergy can be treated successfully by antihistamine drugs.

Recurrent herpetic stomatitis must be differentiated from periadenitis mucosa necrotica recurrens which is characterized by a painful ulcer having a membranous base. This ulcer is frequently larger and deeper than the average aphthous ulcer. Healing is prolonged so that it may take three to five weeks to heal and a residual scar develops. The mouth is extensively scarred in protracted cases.

10. Fisher, A. A. Treatment of herpetic stomatitis with moccasin snake venom. Arch. Dermat. & Syph. 43:444 (March) 1941.

Mobile auxiliary dental unit for hospitals

Spence A. Hutt, D.D.S., Houston, Texas

The dental surgeon closely associated with hospitals frequently has to overcome obstacles. Among difficulties encountered are the treatment of bedridden patients and operating without adequate dental facilities for treating ambulatory patients. To broaden the scope of a dental service in a hospital as well as to surmount the aforementioned difficulties, the mobile auxiliary dental unit described in this article was developed.

A similar piece of equipment was devised by the writer and used in a military hospital during World War II. It resulted from a study into the ways and means of increasing the value of the dental service. The unit discussed in this paper has refinements and additions not found on the original cart which have increased its usefulness and versatility in carrying dental treatment to the bedside of the hospitalized patient.

Many hospitals are not equipped specifically for dental treatment but they do have facilities used on the eye, ear, nose and throat service which also can be used efficiently in conjunction with the mobile dental unit.

Reviewed in the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions published by the author are the result of his own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

Chief, Dental Service, Veterans Administration Hospital, Houston, Texas.

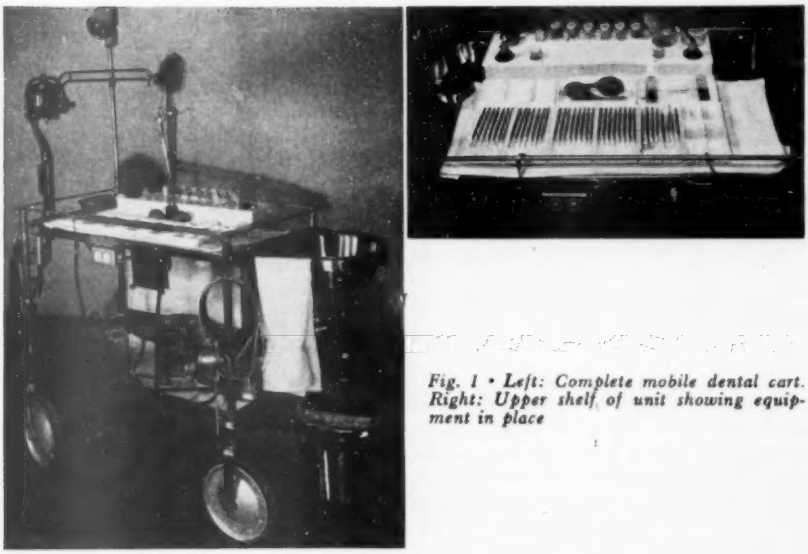


Fig. 1 • Left: Complete mobile dental cart. Right: Upper shelf of unit showing equipment in place

TYPE AND CONSTRUCTION OF UNIT

Equipment usually found on any hospital supply and equipment table, or readily available otherwise, was utilized in planning the construction of this cart. This conveyance was not intended to carry every type of equipment or necessary article, such as complete sets of extraction forceps and surgical necessities, prosthetic supplies, compound heaters and trays, cutting instruments and scalers for the oral hygienist, or the instruments for any and all dental treatments. This would cause it to be unnecessarily cluttered and too cumbersome. Also, the dental assistant or oral hygienist, as a rule, is a woman, and they are responsible for maneuvering the cart to the desired location. The excess nonessentials would make it too difficult to handle. With this in mind, it was thought advisable to have the necessary armamentarium interchangeable. Therefore, when any dental operator wishes to use the cart for his particular specialty, he chooses the instruments he considers necessary, arranges them to his satisfaction, and the cart is wheeled to its destination fully equipped for the operation intended. This has proved much more satisfactory than carrying the instruments in a bag or towel and arranging them, often haphazardly, in full view of the patient, on his bed or on an adjacent bedside table.

This cart is of stainless steel construction which makes it easy to clean and sterilize. It is similar to one used in practically all hospitals. Two swivel wheels permit easy manipulation when placing it in position between beds. A rail surrounds both the top and bottom shelves which reduces the possibility of accidental dislodgment of equipment or supplies and consequent breakage (Fig. 1).

EQUIPMENT CARRIED ON UNIT

Illumination is furnished by means of a bed reading light which, because of the

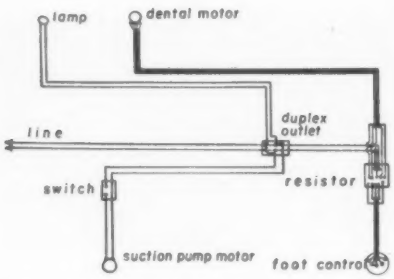


Fig. 2 • Diagram of electric wire used with portable dental unit

magnifying lens, permits a spotlight effect and easy focus. This, however, may be augmented with a headlight such as the one shown hanging from a hook (Fig. 1, left). The dental engine is the type generally used in dental prosthetic laboratories. The foot pedal, equipped with a welded "T" shaped handle to facilitate ease in its removal and proper placement on the floor, is stored on the bottom shelf until ready for use. The medicine bottle retainer is not obtainable as an item of supply, but is custom built. It is constructed of wood, the number and size of the openings depending on the desired contents and their contours. Should there be no air compressor facilities in the ward, bulb operated atomizers will serve very well. A blood aspirator, removed from a Ritter dental unit, is kept on the lower shelf. Experience has proved it to be effective when used as a saliva ejector. It therefore serves in a dual capacity. The basin which is attached to the top shelf may be used for rinsing the hands or washing contaminated instruments in preparation for cold sterilization when the instruments are to be used for subsequent operations prior to returning to the dental clinic. It also may be used advantageously to soak plaster of Paris bandages needed for constructing a plaster headcap on a bedridden patient. The large bucket below the basin is used for waste and debris.

The electric current is brought in on the one wire, with switches to control individual sections (Fig. 2). A double electric outlet is provided and it is situated conveniently below the surface of the upper shelf. Diagnostic lights, pulp testers, cauteries, compound heater or the headlight may be plugged into this.

The use of this cart in combination

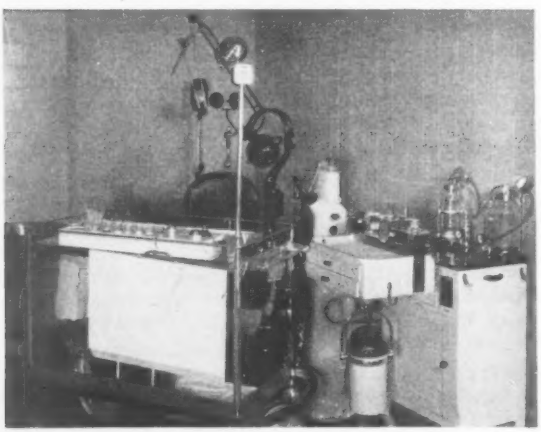


Fig. 3 • Cart may be used in conjunction with the equipment of the eye, ear, nose and throat department

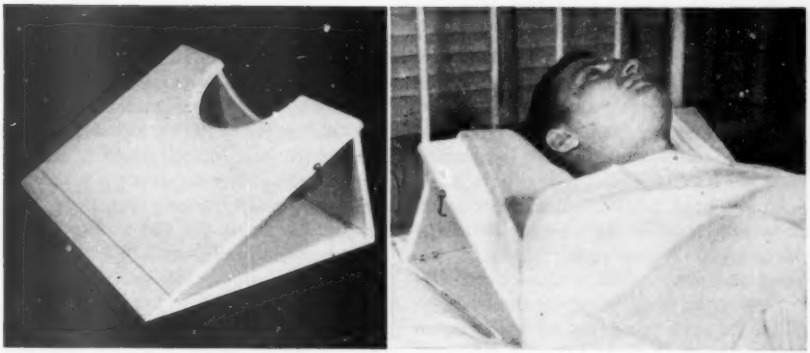


Fig. 4 • Left: Headrest for bedridden patient. Right: Headrest in position

with the equipment commonly found in an eye, ear, nose and throat department, is particularly advantageous since compressed air usually is available in this department (Fig. 3). For that reason, spray bottles should be included with the assortment of instruments. The contents of the medicine bottle retainer, together with the appropriate assortment of instruments and supplies, enables the dentist to work independently and successfully while operating in this section.

A white wooden board, suspended by a handle, hangs on the side of the cart. This is a collapsible headrest used primarily for bedridden patients (Fig. 4, left). Figure 4, right, shows the headrest in position beneath the patient's head, with a bed sheet folded to several thicknesses which often provides adequate padding over the concave portion of the board. However, for operations of long duration, more protection may be required. A two-inch-thick foam rubber

Fig. 5 • Mobile dental unit in use

pad may be substituted. This might be more easily tolerated. The board gives excellent support to the head and retains it in position and controls the movement. It is useful also when applying a plaster headcap for treatment of jaw fractures on a patient who must remain in a supine position because of other bodily injuries. The weight of the head invariably distorts the freshly applied cast, especially in the occipital area, causing it to gap in the temporal regions. After the plaster has been applied and smoothed, the headrest is placed in a position that will remove the compression from the posterior part of the skull. Pressure then can be applied in the temporal region of the cast with pads of gauze or other suitable material, and allowed to remain until the plaster is thoroughly dry.

SUMMARY

The versatility of the mobile unit when the dentist and dental assistant work together, or when only one operator or hygienist use it, can be appreciated best when it has been actually used. The flexibility of the cart is apparent. The fundamental purpose is not to give a complete dental service to the bedridden patient for obviously maximum efficiency is not possible. Rather, the desire is to offer the bed patient as much dental service as is practicable, certainly more than he has been receiving in the past. The facilities of the eye, ear, nose and throat department also can be utilized efficiently in conjunction with the mobile dental unit (Fig. 5).

2002 Holcombe Boulevard

Training of dentists for dental health program service

Carl L. Sebelius, D.D.S., M.P.H., Nashville, Tenn.

The program of continuing postgraduate education for the dentists of Tennessee was adopted in 1938 and has now become a basic part of the program of the Tennessee State Dental Association. It is thought that this type of endeavor is well worth the effort. It means much to the dentist to be able to obtain up-to-date dental information without having to be away from the office for a long period of time. The program provides such an opportunity to each dentist in Tennessee.

With the exception of the war years, the seminar has been an annual affair. Eight separate courses have been conducted to date, with an attendance each year of from 30 to 60 per cent of the members of the Association.

All courses have been sponsored by the Tennessee State Dental Association in cooperation with the Tennessee Department of Public Health. It has been the responsibility of the dental associa-

Abstract of paper read before the Dental Health Section, seventy-eighth annual meeting of the American Public Health Association, St. Louis, Mo., November 3, 1950.

Director of dental hygiene service, Tennessee Department of Public Health, Nashville, Tenn.

tion to plan and conduct the program each year with the state health department assisting financially. All the instructors have emphasized the importance of dentistry for children and the attention that children should receive in the practice of dentistry.

The length of local programs has varied from 12 to 30 hours of instruction in each of the six to nine centers where the courses have been held. The local chairman decides the time of day when the group will meet. Registration fees each year have varied from $5 to $10.

During the first several years, the program was developed and directed by individuals appointed by the president of the Tennessee State Dental Association and by district committees appointed locally. For the past three years, however, the program has become the responsibility of the Dental Health Education Committee of the state society. A member from each district is represented on the committee. In most instances, each member becomes the seminar chairman in his district. He then appoints individuals to serve with him. Each committee is responsible for arranging and conducting locally the seminar and encouraging the dentists to attend. The chairman collects all the registration fees and then sends them to the office of the Association.

Even though the program usually lasts four weeks, the committee is busy throughout the year. During the past several years, approximately 2,000 programs have been printed each year. The printed program has been relatively complete and contains the pictures of the instructors, an outline of the subject matter to be covered and the dates and meeting places.

No doubt, the most ambitious and complete program was the one which was conducted in 1947 on the subject, "Preventive and Protective Procedures Involved in the Care of Children's Teeth." The two instructors were Joseph Hartsook and Henry Wilbur. The program the first two days consisted of discussions of practice management, growth and development, operative and filling procedures and pulp management. On the third day, each instructor demonstrated to a group of dentists the actual dental procedures discussed during the seminar periods. At all the demonstrations, the instructors performed at least three partial pulpotomies. While the lectures were given only six times, the clinical demonstrations were given 18 times. The district chairman in the large districts assigned each dentist to attend a day of clinical demonstration.

Two instructors have served as a team working together at all of the seminars except the second, third and fourth. There were three instructors for the second seminar, but each instructor served only one part of the state.

During the eight seminars, there have been seven manuals prepared. Four of the manuals have been printed with illustrations and complimentary copies sent to selected dentists throughout the United States. The last two manuals have been published in the *Journal of the Tennessee State Dental Association*. In 1947, the most complete manual was published. This manual, entitled *Dentistry for Children*, contained 75 pages of printed material.

Since many of the seminars have been of interest to health workers, dental hygienists, dental assistants and others, special invitations have usually been sent to selected groups to attend the seminar as guests of the Association. In 1950 there were approximately 120 guests.

Every year a special effort has been made to inform the public of this most worth-while activity. During the past three years, each district seminar chairman received well in advance one-column newspaper mats of pictures of the instructors with information of their accomplishments for newspaper use. In

practically every district, the newspapers sent reporters to interview the instructors. The instructors usually have made radio broadcasts and served as luncheon speakers at local civic club meetings. In 1950 the instructors made four radio broadcasts. It is thought that this type of publicity, which informs the public of the activities of the local dental groups, is most worth while.

Every effort has been made by the committee to make the seminar sessions for the instructors, as well as for the dentists, more than just a work session. The seminar group tries to make the period spent by the instructors in Tennessee a most enjoyable experience, and hopes that the program which has been described is one which adds good fellowship to excellent instruction.

Dental status of veterans and nonveterans in foundries

F. J. Walters, D.D.S., and H. P. Brinton,† Ph.D.,*
Washington, D. C.

The recent World War period brought about changes in the distribution of our population. Fifteen million[1] American youths from all parts of our country entered the armed services. At the same time, industrial areas became increasingly congested as the population shifted to meet the demands of manpower necessary to support greatly expanded war industries. Movement of population, either to the Armed Forces or to the industrial areas, influenced the dentist-patient ratio with the result that the Armed Forces experienced a more favorable ratio than the industrial areas. Therefore, it was believed to be of interest to determine the extent to which such changes in the dentist-patient ratio may have affected the dental status of those having had Armed Forces experience and of those who remained as civilians.

POSSIBLE INFLUENCES

A recent study conducted by the U.S. Public Health Service of the health status of workers in the ferrous foundry industry in the Chicago area[2] offered an opportunity to evaluate pertinent information concerning the dental status of a number of veterans and nonveterans

*Senior dental surgeon, Division of Industrial Hygiene, U. S. Public Health Service.

†Senior statistician, Division of Industrial Hygiene, U. S. Public Health Service.

1. Data as of January 1, 1948. Personal communication from the Veterans Administration.

2. Health of ferrous foundrymen in Illinois. Public Health Service Publication, no. 31. Washington, Federal Security Agency, 1950.

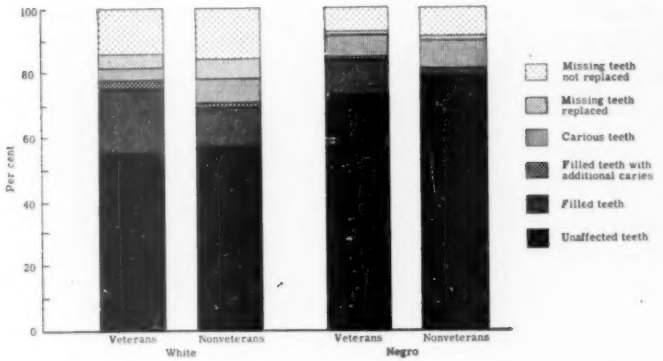


Fig. 1 • Percentage distribution of conditions found in teeth of male foundry workers between the ages of 20 to 39 years, according to race and veteran status

of World War II. Data obtained from the study of these two groups were compared to show possible differences in the condition of the teeth. However, before making such comparisons careful consideration was given to extrinsic factors which might influence the composition of the groups studied. For example, persons entering the Armed Forces were required to pass a physical examination which included an examination of the teeth and supporting structures. Those selected had to meet certain dental standards adopted by the various serv-

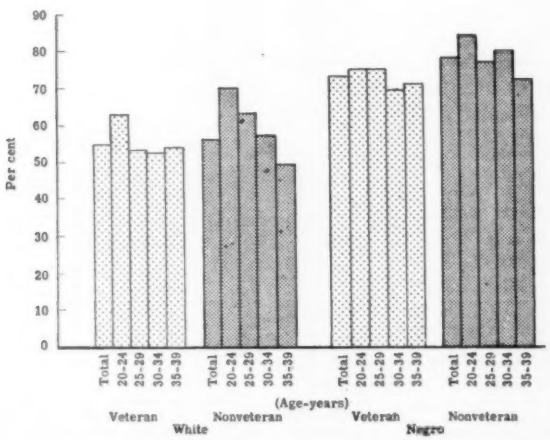


Fig. 2 • Percentage of unaffected teeth among male foundry workers according to race, age and veteran status

Table 1 • Number of missing teeth, teeth indicated for extraction, filled teeth, and untreated carious teeth per male foundry worker, according to veteran status, age, and race[1]

Age (years)	White					Negro				
	Number of workers	Rate per person				Number of workers	Rate per person			
		Missing teeth	Teeth to be extracted	Filled teeth[2]	Untreated carious teeth		Missing teeth	Teeth to be extracted	Filled teeth[2]	Untreated carious teeth
				Veteran						
Total	213[3]	5.9	0.5	7.2	1.4	132	3.0	0.4	3.7	1.9
20–24	48	4.3	0.3	6.8	1.4	39	2.1	0.4	3.7	2.2
25–29	78[4]	5.7	0.4	7.5	1.8	49	2.4	0.4	3.7	1.9
30–34	68[4]	6.6	0.6	7.5	1.2	25	4.5	0.3	3.8	1.8
35–39	19	8.0	1.9	6.4	0.4	19	4.3	0.4	3.6	1.4
				Nonveteran						
Total	295[5]	7.5	1.0	4.1	2.5	236[4]	3.2	0.8	0.8	3.0
20–24	33	4.1	0.5	3.0	2.5	48	1.8	0.5	0.5	2.7
25–29	32	5.9	0.6	2.9	3.0	46	2.2	0.8	1.1	4.0
30–34	102[6]	6.6	1.0	4.6	2.6	69	3.0	0.8	0.8	2.6
35–39	128[7]	9.5	1.2	4.4	2.3	73[4]	5.0	1.1	0.8	3.0

1. Edentulous persons excluded except in computing rate of missing teeth.
2. Includes filled teeth with additional caries.
3. Includes 2 edentulous persons.
4. Includes 1 edentulous person.
5. Includes 15 edentulous persons.
6. Includes 3 edentulous persons.
7. Includes 12 edentulous persons.

ices. It was estimated that missing or impaired teeth as the principal cause for rejection amounted to only 0.9 per cent for the white males and 0.2 per cent for the negro males.[3] Hence, it was concluded that little difference in the composition of the two groups occurred as a result of dental requirements for those entering the Armed Forces.

Since the foundry industry was classified as an essential war activity, occupational deferment was possible for certain necessary employees.[4] Because of such occupational deferment, differences in the general physical condition of the persons in the two groups studied were less likely. Differential influences of the foundry environment should not affect the comparison of the dental findings of the two groups as there were no important differences in the type of foundry jobs held by the veteran and the nonveteran worker. Thus, the extrinsic factors, possibly affecting the composition of the two groups, such as physical and dental requirements and present environment which might contribute to differences in the dental data obtained for the two groups, are minimized.

POPULATION STUDIED

The foundry study conducted in 1948 included a complete medical examination with chronological history of past occupational activities and a thorough dental examination of 1,903 workers. Of this group, 876 were between the ages of 20 and 39, inclusive. The pres-

3. Selective Service System. Physical examinations of selective service registrants. Special monograph, no. 15, vol. 1. Washington, Government Printing Office, 1947, p. 157.

4. Selective Service System. Industrial deferment. Special monograph no. 6, vol. 1. Washington, Government Printing Office, 1947, p. 117.

ent study was limited to persons of these ages since the number of veterans below 20 and over 39 was too small to be of value for comparative purposes. Of these 876 workers, 345 were veterans and 531 nonveterans. Persons classified as veterans were those who gave a history of service in any of the Armed Forces between 1940 and 1948 for a period of 90 days or more or who had been discharged before 90 days of service for reasons of service-incurred disability.

METHOD

The dental examination was performed concurrently with the medical examination by two dentists of the U. S. Public Health Service, utilizing standard dental equipment. Conditions recorded were those which could be observed with the aid of a plane mouth mirror and diagnostic light properly adjusted to assure maximum illumination.

In evaluating dental status in terms of past treatment and accrued need of the veteran and the nonveteran, an excellent opportunity is provided to make reliable measurements, since structures of the teeth are such that any present accrued pathosis or past dental treatment will be evident. The quantity of past dental treatment will be observed in the form of teeth filled, teeth missing and teeth replaced. The accrued need may be shown in the form of carious teeth needing fillings, teeth requiring extraction and teeth requiring replacement. For purposes of this presentation, teeth showing no evidence of caries attack are referred to as unaffected teeth. Teeth missing are referred to merely as missing teeth with no attempt made to ascertain the cause contributing to their loss. All data are presented on the basis of 32 teeth per person.

DENTAL STATUS

Figure 1 shows the basic comparison in percentage distribution of the teeth according to conditions for all ages, white and negro, veteran and nonveteran. The percentage of teeth which were unaffected for the white showed little difference from the standpoint of veteran status. The nonveterans of the negro group are slightly favored with more unaffected teeth than the veterans. In each case the negro workers have more unaffected teeth than the white workers. Teeth which were filled and showed no carious lesions were found to represent 20.9 per cent of the total among white veterans and 11.5 per cent among white nonveterans. Among the negro workers these percentages fell to 10.8 and 2.4 respectively. Teeth which were both filled and had additional caries were also more frequent in the veteran groups. Carious teeth, excluding those which also had been filled, represented 4.2 per cent for white veterans; 7.4 per cent for white

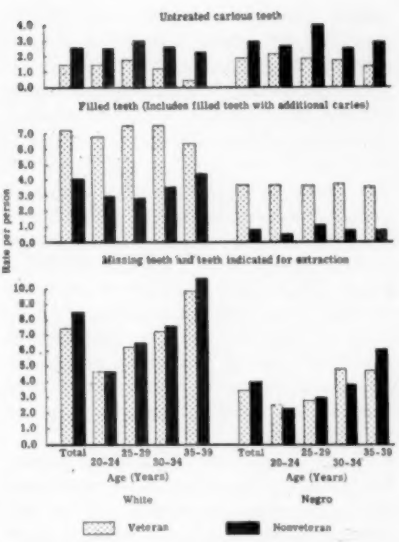


Fig. 3 • Number of missing teeth, filled teeth and untreated carious teeth per male foundry worker according to veteran status, age and race

nonveterans; 5.9 per cent and 9.3 per cent for the negro veterans and nonveterans, respectively.

The remaining classification of teeth, namely, those missing and not replaced, shows slight difference with veteran status for either of the racial groups. However, the percentage of teeth missing was much lower for the negro group. Missing teeth that had been replaced were less common in the veteran than in the nonveteran group. White males had more teeth replaced than negro males. Dental treatment for veterans in each case reflects a different pattern than for nonveterans, with such differences being more pronounced for the negro groups than for the white groups.

Figure 2 shows for different age groups the percentage distribution of unaffected teeth according to veteran status for white and negro. With respect to each age group the veteran negro workers have fewer unaffected teeth than the nonveteran. This is also true for the white workers with the exception of age group 35 to 39.

Table 1 and Figure 3 show the rate of missing teeth, filled teeth, and untreated carious teeth per Illinois male foundry worker. For each respective age group, white and negro, the rate of untreated carious teeth per person is lower for the veterans than the nonveterans, while the rate of filled teeth is higher with the exception of white workers in the age group 35 to 39. The rate of teeth to be extracted per person is lower for the veterans than nonveterans.

The rate of teeth missing plus those indicated for extraction shows that veterans have a more favorable experience for all ages with the exception of negro males 30 to 34 years. The negro veterans and nonveterans have a pattern similar to the white veterans although the gen-

Table 2 • Percentage of individuals with designated number of filled teeth among Illinois male foundry workers according to veteran status, age, and race[1] (filled teeth with additional caries excluded)

Number of teeth filled	White				Negro			
	Age (years)				Age (years)			
	20–24	25–29	30–34	35–39	20–24	25–29	30–34	35–39
Veteran								
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
None	8.3	5.2	6.0	5.3	20.5	24.5	8.0	21.0
1–3	25.0	14.3	17.9	15.8	35.9	36.7	48.0	36.9
4–6	18.8	32.4	28.4	36.8	30.8	22.4	32.0	26.3
7–9	27.1	23.4	19.4	21.0	10.2	8.2	8.0	10.5
10–12	8.3	18.2	19.4	15.8	0.0	8.2	0.0	5.3
13 or more	12.5	6.5	8.9	5.3	2.6	0.0	4.0	0.0
Nonveteran								
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
None	39.4	46.9	33.3	30.2	58.3	58.7	65.2	61.1
1–3	18.2	28.1	19.2	25.9	41.7	30.4	29.0	33.3
4–6	24.2	6.2	18.2	18.1	0.0	8.7	4.4	5.6
7–9	18.2	9.4	16.1	12.9	0.0	2.2	1.4	0.0
10–12	0.0	3.1	6.1	7.7	0.0	0.0	0.0	0.0
13 or more	0.0	6.3	7.1	5.2	0.0	0.0	0.0	0.0

1. Edentulous persons excluded.

eral level of teeth missing plus those indicated for extraction is consistently lower for all age groups. In Table 1 the summation of the number of missing teeth, teeth indicated for extraction, filled and untreated carious teeth is not to be construed as a total DMF because included in the rates for filled and untreated carious teeth are a certain number which are also indicated for extraction.

Tables 2 to 5 show the percentage of veterans and nonveterans who had a designated number of teeth with certain specified conditions.

It is emphasized that data presented for persons with no missing teeth include third molars. Recognizing that the data do not take into account the condition of the teeth it will be noted that the percentage of persons with no missing teeth is larger for the nonveterans than for the veterans for both races and all age groups, except the 35 to 39 year old white males. Fewer veterans may have 32 teeth present because their severely decayed teeth may have been extracted, whereas the nonveterans may have present all 32 teeth, some of which may be indicated for extraction.

Persons with no untreated carious teeth were decidedly more common among white veterans than nonveterans, while for the negro the reverse is true. Very few veterans of either race had 7 or more untreated carious teeth, but all age groups of nonveterans showed some persons in this category.

DENTAL NEED

Dental need was ascertained at the time of the examination. An effort was made by the two examiners to set the same standards. Dental needs have been grouped as follows: (1) teeth requiring fillings,

Table 3 • Percentage of individuals with designated number of filled teeth with additional caries among Illinois male foundry workers according to veteran status, age, and race[1]

Number of filled and carious teeth	White				Negro			
	Age (years)				Age (years)			
	20–24	25–29	30–34	35–39	20–24	25–29	30–34	35–39
Veteran								
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
None	62.5	70.1	73.1	89.5	87.2	79.6	84.0	89.5
1	29.2	15.6	20.9	5.3	7.7	12.3	16.0	10.5
2	4.1	7.8	4.5	0.0	2.6	0.0	0.0	0.0
3	2.1	0.0	1.5	0.0	2.5	4.1	0.0	0.0
4	2.1	2.6	0.0	5.2	0.0	4.1	0.0	0.0
5 or more	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0
Nonveteran								
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
None	75.8	90.6	85.9	83.6	100.0	97.8	98.6	100.0
1	21.2	9.4	4.0	9.5	0.0	2.2	1.4	0.0
2	3.0	0.0	5.1	2.6	0.0	0.0	0.0	0.0
3	0.0	0.0	4.0	2.6	0.0	0.0	0.0	0.0
4	0.0	0.0	1.0	0.9	0.0	0.0	0.0	0.0
5 or more	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0

1. Edentulous persons excluded.

Table 4 • Percentage of individuals with designated number of missing teeth among Illinois male foundry workers according to veteran status, age, and race[1]

Number of missing teeth	White				Negro			
	Age (years)				Age (years)			
	20–24	25–29	30–34	35–39	20–24	25–29	30–34	35–39
	Veteran							
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
None	8.3	2.6	1.5	5.3	28.2	22.5	12.0	10.5
1–3	35.4	28.2	35.3	21.0	51.3	49.0	44.0	31.6
4–6	39.6	37.2	26.4	15.8	17.9	24.5	24.0	47.4
7–9	8.3	19.2	19.1	31.6	0.0	2.0	8.0	5.3
10–12	6.3	7.7	10.3	5.3	2.6	2.0	8.0	0.0
13 or more	2.1	5.1	7.4	21.0	0.0	0.0	4.0	5.2
	Nonveteran							
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
None	12.1	9.4	4.9	0.0	43.8	23.9	23.2	19.2
1–3	45.5	18.7	33.3	17.2	33.3	56.5	40.6	28.8
4–6	24.2	34.4	30.4	36.7	18.7	10.9	23.2	23.3
7–9	9.1	21.9	14.7	14.9	4.2	6.5	11.6	13.7
10–12	3.0	9.4	3.9	11.7	0.0	2.2	1.4	8.2
13 or more	6.1	6.2	12.8	19.5	0.0	0.0	0.0	6.8

1. Includes edentulous persons.

including carious teeth and filled teeth with additional caries for which further treatment by fillings was indicated; (2) extractions indicated, which included teeth with extensive or advanced caries, malpositioned or partially impacted third molars, and teeth showing advanced periodontosis with considerable mobility; and (3) teeth requiring replacement, which included teeth already missing and not satisfactorily replaced, and teeth indicated for extraction which would need replacement. Excluded from the last named group are third molars, unilaterally missing second molars when the adjacent third molar was missing, and teeth missing for a long period of time where the remaining teeth have shifted to close the space. No attempt was made at the time of the examination to recommend any particular type of replacements because of the multiple ways these needs could be met.

Figure 4 shows, for all ages, teeth to be extracted, filled and replaced per person. It will be observed that for extractions indicated the white veterans have a more favorable experience than nonveterans with a rate of 0.54 and 1.00, respectively. The negro group shows a similar but still more favorable experience with 0.36 extractions indicated per veteran as opposed to 0.82 per nonveteran.

With regard to the number of teeth requiring fillings, both white and negro show a more favorable condition prevailing among veterans. It will be noted, however, that there are more filled teeth with additional caries requiring fillings among the veteran than the nonveteran group for both white and negro. An explanation of this is offered by the fact that veterans have more teeth filled than nonveterans with a consequent greater chance that some of the filled teeth may

Table 5 • Percentage of individuals with designated number of untreated carious teeth among Illinois male foundry workers according to veteran status, age, and race[1]

Number of untreated carious teeth	White				Negro			
	Age (years)				Age (years)			
	20–24	25–29	30–34	35–39	20–24	25–29	30–34	35–39
	Veteran							
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
None	47.9	37.6	49.2	73.7	20.5	34.7	20.0	36.8
1 and 2	27.1	33.8	37.3	26.3	46.2	40.8	60.0	42.1
3 and 4	20.8	20.8	7.5	0.0	20.5	8.2	8.0	15.8
5 and 6	4.2	5.2	4.5	0.0	5.1	14.3	12.0	5.3
7 and 8	0.0	1.3	0.0	0.0	7.7	2.0	0.0	0.0
9 or more	0.0	1.3	1.5	0.0	0.0	0.0	0.0	0.0
	Nonveteran							
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
None	27.3	31.3	29.3	31.9	20.8	13.1	24.6	25.0
1 and 2	27.3	25.0	38.4	40.5	33.3	30.4	33.3	29.2
3 and 4	30.3	18.8	12.1	12.1	18.8	23.9	21.7	18.0
5 and 6	12.1	12.5	9.1	7.8	20.8	15.2	10.2	18.0
7 and 8	0.0	6.2	4.0	3.4	6.3	6.5	4.4	4.2
9 or more	3.0	6.2	7.1	4.3	0.0	10.9	5.8	5.6

1. Edentulous persons excluded.

have subsequently become carious.

When considering the number of teeth indicated for replacement, the white veteran requires 2.99 per person as compared with 3.90 for the nonveteran. Among the negro group there are less replacements indicated than for the white, with a rate of 1.72 for veterans and 2.24 for nonveterans.

For individual mouths, it is found that for the white veterans 70.1 per cent required one or more teeth replaced as opposed to 73.2 per cent for the nonveterans. The negro workers show a more favorable status, with one or more teeth replacements required for 51.5 per cent of the veterans as opposed to 55.3 per cent of the nonveterans.

DISCUSSION

Generally speaking, the Armed Forces attempted to provide one dentist for each 500 persons, whereas the figure for the general population in 1940 was one dentist for 1,800 persons.[5] When desired, the services of a dentist were in most cases available to the Armed Forces without a long delay. This may not have been possible for persons outside the Armed Forces. Because of the shift in population, the extra task of providing services to an increasing number of persons with fewer dentists may have made it impossible for nonveterans to obtain a dental appointment without prolonged delay.

In addition to the changes in dentist-patient ratio other factors may account for the differences occurring in the two groups. Members of the Armed Forces were educated to the value of good per-

5. Sixteenth census of the United States (1940). Population, vol. 3, Labor force, occupation, industry, employment and income, part 1, U.S. summary. Washington, Government Printing Office, 1943.

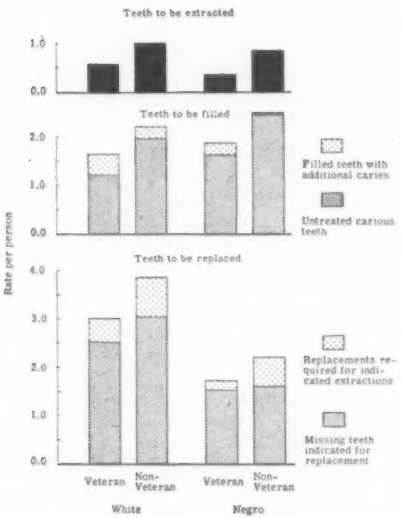


Fig. 4 • Number of teeth required to be extracted, filled and replaced per male foundry worker between the ages of 20 and 39 years, according to race and veteran status

sonal hygiene including oral hygiene and regular dental care, and were motivated to avail themselves of early dental treatment. After having received regular dental care while in the Armed Forces, veterans may have continued to seek such care subsequent to their discharge. Also, since this study was conducted three years after the beginning of demobilization, there is a chance that certain veteran benefits, made available to eligible groups, may have contributed to the differences in dental status and dental need.

SUMMARY

Two similar groups of veterans and nonveterans, white and negro male foundry workers, 20 to 39 years of age, were studied to show differences in dental status and dental need. Certain influencing factors are reflected in that the veterans are favored with more filled teeth, fewer untreated carious teeth, fewer teeth to be filled, fewer teeth to be extracted and fewer teeth indicated for replacement. These differences are statistically significant.

Authors and Editors • The author's job is to convey something from himself to his reader so well that the message conveyed will be gladly received and recognized for what it is. This is not a simple task; and it is not true that any set of words will do it, for there are no indifferent words. Every word of an article does good or ill; sections, paragraphs, sentences, phrases, words, or even parts of a word are evil if they can be done without. They make an article longer than it need be and the potential reader may decide that it is too long to attempt; they raise issues not connected with the main theme and so lessen the reader's enthusiasm and concentration; they irritate the fastidious and critical, the very people whose judgment and comments the author should particularly wish to enlist; and, worst of all, they may obscure the meaning. Editors who shorten articles often plead lack of space, but their real justification is the harm done by everything that can be done without. *J. W. Howie, M.D., "On Writing to be Read," Lancet 261:320, August 25, 1951.*

The application of electromyography to dental research

Samuel Pruzansky, D.D.S., M.S., Chicago

Most of the knowledge concerning neuromuscular physiology has been derived from experiments and observations on the muscles of the extremities. Such research has originated where the interest is remote from the clinical problems in dentistry. There has been little research into the neuromuscular physiology of the masticatory mechanism and of the muscles of facial expression. Fundamental information derived from such studies may provide a scientific basis for habilitation and rehabilitation of patients with congenital or acquired dentofacial anomalies. The paucity of such research may be attributed to the lack of suitably simple methods applicable to the study of clinical material. In recent years electromyography has been so adapted as to provide the clinician with a useful instrument for the study of a variety of neuromuscular disorders. Electromyography has also proved valuable in analyzing the kinesiologic behavior of normal muscles.

The purpose of this paper is to indicate how electromyography may be applied to certain fields of dental research. It is of primary importance to understand the method, its basis in fact, and its possibilities and limitations.

CONTROL OF MOTOR ACTIVITY

The contractility of muscle, together with the reception and transmission of impulses regulating muscle activity, is fundamental to the survival of multicellular animals. A knowledge of the anatomy and physiology of the motor mechanism is requisite to the understanding of the variety of disturbances in human motion and locomotion.

Voluntary impulses arise in the cerebral cortex and are conveyed by the motor tract to the nuclei of motor nerves in the brain or spinal cord. Actually, the successful execution of a purposeful movement involves much more than the relay of an impulse from the upper motor neuron in the cerebral cortex to the lower motor neuron which acts to innervate the muscle. Several higher centers are concerned in integrating and coordinating the action of several muscle groups during a given movement. In addition, peripheral stimuli from the labyrinth of the inner ear, from the eyes, and from the proprioceptive nerve endings in muscles, tendons and joints, converge centrally and act to modify muscle movements. Disease processes may attack the neuromuscular system at any point. The

Presented before the Section on Research combined with the Section on Orthodontics, ninety-second annual session of the American Dental Association, Washington, D. C., October 16, 1951.

From the departments of orthodontia, physical medicine and rehabilitation and physiology, University of Illinois, College of Medicine and College of Dentistry, Chicago.

Special research fellow, National Institute of Dental Research, United States Public Health Service.

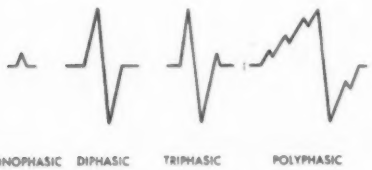


Fig. 1 • Diagrammatic representation of various wave forms as viewed on the cathode ray oscilloscope

geography of the lesion determines the clinical picture.

The muscles of mastication and the facial muscles may be susceptible to the same disturbances affecting muscles elsewhere in the body. In addition to the general variety of central and peripheral disturbances of the neuromotor mechanism which may affect the muscles of mastication, the peculiarity of the afferent influences which serve to modify the central control must be considered. The mandible differs from most bones in that it has a bilateral joint. Any movement of the jaw requires bilateral coordination. Sensations from the teeth, periodontal membranes and oral mucosa, plus the synkinetic movements of the tongue, lips and cheeks are important to the regulation of mandibular movement. During speech the synergies of the masticatory muscles are involved with the activities of many other nerve centers.

Admittedly, bizarre neuromuscular disorders are not the daily preoccupation of the dentist. But every day, and in many ways, the dentist must cope with sensory and proprioceptive disturbances which modify the motor activity of the muscles of mastication and the function of the temporomandibular articulation. For example, the patient with a "high spot" on a newly cemented inlay soon finds that his pattern of chewing is changed. Individuals with malposed teeth, periodontal ailments, and those with prosthetic appliances are consciously and unconsciously adjusting the neuromuscular control of the temporomandibular articulation as a consequence of altered peripheral stimuli. The central nervous system integrates the pattern of masticatory movements with the anatomic factors present. The variations in these patterns should be plotted and means studied by which changes can be influenced in the patterns of mandibular movement.

THE MOTOR UNIT

To understand the manner in which the neuromuscular system functions, a brief discussion of the motor unit is warranted. A motor unit is composed of the group of muscle fibers which are innervated by the branches of an axon arising from a single anterior horn cell or lower motor neuron.[1]

A muscle with its total motor nerve supply comprises an assembly of motor units. Not all motor units are of the same size. The number of muscle fibers innervated by a single motor neuron is referred to as the innervation ratio. Further, all the motor units within a given muscle do not possess the same innervation ratio. On the average, certain muscles possess motor units with characteristic innervation ratios. For instance, Clark[2] found innervation ratios of 1:120 to 1:165 for some of the leg muscles of the cat, while the extrinsic eye muscles have been reported to contain as few as three to six muscle fibers per motor unit.[3] Smaller innervation ratios make possible better nervous control for delicacy of movement.

The gradation of muscular responses

1. Sherrington, C. Some functional problems attaching to convergence. Proc. Roy. Soc. s. B, London 105:332 (Sept. 2) 1929.

2. Clark, D. A. Muscle counts of motor units: a study in innervation ratios. Am. J. Physiol. 96:296 (Feb.) 1931.

3. Tergast, P. Ueber das Verhältniss von Nerve und Muskel. Arch. Mikr. Anat. 9:36, 1873.

is due, in part, to the number and frequency of motor unit discharges. The smoothness of the response is, in the main, a consequence of the asynchronous activity of the motor units.

THE ACTION POTENTIAL

Electromyography is the study of the electrical activity of muscle. When a muscle contracts, a minute fraction of the total energy liberated appears as electrical energy known as the action current.[4] The formation of normal action currents, or action potentials, is apparently due to polarization changes accompanying the almost synchronous contraction of the muscle fibers comprising one motor unit. The individual action potential, as recorded on the cathode ray oscilloscope, possesses the following characteristics:[5] (1) wave form; (2) amplitude; (3) duration and (4) frequency (Fig. 1).

An additional characteristic, not attributable to the individual action potential but rather to the pattern created by a number of action potentials, should be considered. During a normal contraction, increased effort will elicit a greater number of motor units discharging asynchronously and in greater frequency. The additive and overlapping wave forms will mask the form of the individual action potential and produce an interference pattern.

Alterations in the characteristics of the individual action potential and in the total pattern of electrical discharge may be distinctive and of pathognomonic importance.

ELECTROMYOGRAPHIC EQUIPMENT

Comprehension of the electrical aspects of muscular contraction has advanced considerably since the crude experiments of Galvani and has depended, in large part, on the application of electronic equipment to the problems in biology. Although the apparatus employed in electromyography is fairly complex, it may be described in terms of its three basic components. These are (1) suitable electrodes which will effectively pick up and transmit the electrical impulse from the muscle without too much local polarization, (2) an amplifier to magnify the voltages received from the muscle and to provide sufficient power to activate, (3) some form of mechanism for recording the impulse from the amplifier without lag or serious inertia (Fig. 2).

The choice of electrode varies with the information desired and the accessibility of the muscle. Three types of electrodes are commonly employed: surface electrodes, coaxial needle electrodes and monopolar needle electrodes.

4. Hill, A. V. The energy involved in the electrical change in muscle and nerve. Proc. Roy. Soc. s. B. London 92:178 (June) 1921.

5. Huddleston, O. L., and others. The use of electromyography in the diagnosis of neuromuscular disorders. Arch. Phys. Med. 31:378 (June) 1950.

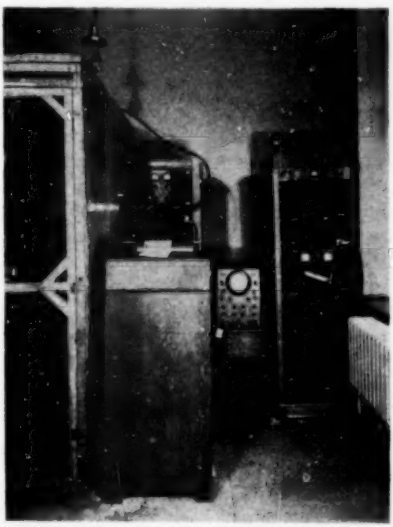


Fig. 2 • Electromyographic equipment. The copper wire room is partly visible at the left

The employment of surface electrodes in this study is generally limited to the muscles that are immediately subjacent to the skin surface. Surface electrodes allow estimation of the integrated electrical activity from the ill-defined mass of muscle underlying the electrodes. By placing these electrodes in comparable positions on paired symmetrical muscles, the electrical activity of the muscles may be compared under conditions of rest, voluntary contractions, passive movement, nerve trunk stimulation and tendon jerk. If a unilateral muscle is affected, the contralateral muscle thus serves as a control.

Needle electrodes, by virtue of their limited detection range, allow localization of the potentials and hence are of value in the study of individual motor units. This quality permits accurate definition of certain pathologic lesions. In addition, needle electrodes provide access to muscles otherwise not accessible through the use of surface electrodes.[6] In all instances, records are obtained with the subject shielded in a copper wire room to eliminate outside electrical interferences.

A detailed discussion of amplifier systems is beyond the scope of this paper. However, the need for careful consideration of the factors affecting the function of the amplifiers before making records has been stressed.[7] The reliability of records obtained is clearly dependent on the constant control of the recording instruments.

Recording devices include (1) a crystographic inkwriting recorder and a synchronous controlled speed, motor driven paper feed; (2) cathode ray oscilloscope and (3) a sound amplifier.

As with electrodes, each recording device has its particular limitations and the choice of method varies with the particular problem. The inkwriter has certain advantages in that it provides an immediate, inexpensive and permanent record. It permits of simultaneous recordings from several channels. Thus the synergistic action of several muscles may be recorded during a given movement. Inherent in the mechanism of the inkwriter are disadvantages not present in the other recording devices. Fidelity of recording is limited to a smaller range of frequencies. The inertia of the pens does not permit accurate reproduction of wave form.

The cathode ray oscilloscope which is relatively free from inertia affords the most accurate means for wave form analysis. For simultaneous recordings multiple beam scopes are required and these are expensive. Permanent records must be made by means of special photographic equipment. The cost involved prohibits the routine use of film. More recently the magnetic tape recorder has been employed to provide a permanent and less expensive record of the action potential.[8]

The sound amplifier allows recognition of the potentials by sound. Thus the intensity of a voluntary contraction is directly related to the magnitude of the rumbling noise received over the amplifier. Certain pathologic forms of action potentials are readily recognizable by their characteristic sounds.

In view of the varying circumstances under which electromyographic recordings may be obtained, a detailed description of the methods employed should accompany all data and uniform procedure should be maintained in order to obtain comparable recordings.

Diagnosis and differentiation of neuromuscular disorders by means of electromyography rest on the ability to observe

6. Moyers, R. E. An electromyographic analysis of certain muscles involved in temporomandibular movement. Am. J. Orthodont. 36:481 (July) 1950.

7. Schwartz, R. P.; Heath, A. L., and Hudson, F. W. Instrumentation in relation to electromyography: Part I. Factors influencing recording and interpretation of electromyograms. Arch. Phys. Med. 30:383 (June) 1949.

8. Kendell, H. W., and others. Researches in electromyology: preliminary studies. Arch. Phys. Med. (In press).

and record quantitative and qualitative variations in the electrical activity of the involved muscles. Various drugs such as prostigmine and curare, by virtue of their action on the neuromuscular system, are employed as valuable adjuncts to electromyographic diagnosis.

REVIEW OF THE LITERATURE

Only a few papers on electromyography have appeared in the dental literature thus far. In a series of two papers, Moyers described a technic for recording the action potentials of the muscles of the temporomandibular articulation.[6, 9] The data were collected on an electroencephalograph with crystographic inkwriting recorder employing multiple channels. The subjects were normal children and adults free from temporomandibular articulatory difficulties. The demonstrated ability to fractionate the actions of the anterior, middle and posterior bellies of the temporal muscle was particularly significant. The synergistic behavior of the three parts of the temporal muscle was shown to differ in individuals with Angle Class II, division 1 malocclusions when compared with similar recordings in normal individuals.

In addition, action potentials from the temporal muscle were illustrated during a variety of movements including lateral excursion, retraction from a protruded position, mandibular depression and elevation, and in physiologic rest position. Proprioceptive impulses arising from occlusal interferences occurring during the exfoliation of deciduous teeth were shown to alter the pattern of contraction in the temporal muscle during mandibular elevation. The simultaneous contribution of the external pterygoid muscle and the digastric muscle to the opening movements of the mandible was recorded. In similar fashion, the activity of the internal pterygoid muscle was described during different mandibular movements. Obviously this represented a new and dynamic approach to the understanding of the functions of the musculature activating the temporomandibular articulation. Such information could not be gained in the anatomy laboratory.

Electrical action currents have been employed in an effort to measure the force exerted in chewing various foods.[10] The current was registered from a single masseter muscle and the record obtained by the use of a sensitive string galvanometer. The output of electrical energy from the masseter muscle served as an index to the degree of effort exerted in masticating foods of various consistency. The differences observed were not accurately quantitated but merely recorded as semiquantitative differences in the average amplitude of the action potentials.

The postoperative changes in two patients who had undergone subcondylar osteotomies for the correction of Angle Class III malocclusions were analyzed by means of cephalometric and laminagraphic roentgenography as well as by electromyography.[11]

More recently efforts at correlating action potentials from the facial musculature with intraoral forces as recorded with strain gages were revealed.[12]

CURRENT RESEARCH

This study is an integral part of the research program in electromyology that is being carried on jointly by the department of physical medicine and rehabilitation of the College of Medicine of the University of Illinois, and the Armour

9. Moyers, R. E. Temporomandibular muscle contraction patterns in Angle Class II, Division I malocclusions: an electromyographic analysis. Am. J. Orthodont. 35:837 (Nov.) 1949.

10. Neumann, H. H. Electrical action currents during mastication. Measurement of the effort exerted in chewing various foods. J. D. Res. 29:463 (Aug.) 1950.

11. Pruzansky, S., and others. Cephalometric, electromyographic, and laminagraphic analysis of two cases of bilateral subcondylar osteotomy. (Abst.) Am. J. Orthodont. 37:147 (Feb.) 1951.

12. Margolis, H. I.; Hoffmeister, F., and Prakash, P. Myometric studies as they apply to clinical orthodontics. Unpublished.

Research Foundation of the Illinois Institute of Technology.

Present studies are concerned with mapping the electromyographic patterns of certain facial muscles, including the muscles of mastication, in normal and pathologic conditions in man. So far, more than 50 patients have been studied. Included were individuals at various age levels with normal dentofacial development, good occlusion and freedom from temporomandibular joint disturbances. Pathologic conditions included a variety of malocclusions, edentulousness with and without dentures, temporomandibular joint disorders, bulbar poliomyelitis, parkinsonism, myasthenia gravis, cerebral palsy, brain tumors, cleft lip and cleft palate.

In view of the variety of cases studied, records were obtained utilizing needle and surface electrodes and recording either on the inkwriting crystograph or by means of the cathode-ray oscilloscope. The choice of method depended on the problem being studied. However, in the present report only the data obtained by surface electrodes and recorded on the inkwriter will be presented.

METHODS

Simultaneous recordings were obtained from the masseter muscle and the three bellies of the temporal muscle on one side. Subsequently and at the same sitting the recordings were repeated on the muscles of the opposite side. To record the activity of the masseter muscle, paired surface electrodes were disposed over the motor point and parallel to the general course of the muscle fibers. The method employed for fractionating the activity of the temporal muscle was described by Moyers.[9] In a second series, simultaneous records of the activity of both temporal masseter muscles were obtained. In this instance no attempt was made to fractionate the activity of the temporal muscle and therefore such records were derived from paired surface electrodes placed on the muscle. In a third set of recordings, the simultaneous activity of the temporal, masseter, suprahyoid and infrahyoid muscles was recorded. The electrodes were placed in pairs over the anterior belly of the digastric muscle and over the sternohyoid muscle. These muscles were best palpated when the mandible was depressed against resistance.

MOVEMENTS OF THE MANDIBLE

The intact muscle is extremely sensitive to the demands of external forces. Thus in describing a particular motion care must be taken to qualify that motion in terms of (1) speed of the motion, (2) resistance to the motion and (3) posture of the limb in relation to gravity during the motion. All of these factors may alter the innervational activity of the muscle and are reflected in the electromyogram.[13]

Of the several movements of the mandible studied by means of electromyography, the masticatory stroke was the most interesting. Sicher[14] divided the masticatory movements into three phases: ". . . the first or preparatory phase is a free movement of the lower jaw; the second phase ends after contact of certain teeth is established; the third phase is a truly articulatory movement; that is, it occurs under contact of teeth. The first phase does not require any force; force is applied only during the second and third phases, the masticatory stroke in a strict sense."

It is apparent that the masticatory stroke involves a constant change in the innervational activity of the masticatory muscles. In its first phase, the stroke is a nonresistive movement whereas in the

13. Steindler, A. Mechanics of normal pathological locomotion in man. Springfield, Ill., Charles C Thomas, 1935, p. 108.

14. Sicher, H. Oral anatomy. St. Louis, C. V. Mosby Co., 1949, p. 177.

second and third phases it encounters a great deal of resistance. The speed of the various phases may likewise differ. The free swing of the mandible is a rapid movement in comparison to the more deliberate phase wherein occlusal contact is encountered. The change in posture of the mandible relative to its articulations influences the stabilizing actions of the masticatory muscles.

O'Rourke[15] analyzed the masticatory stroke as two distinct movements of the mandible, one for crushing and the other for trituration. The first involved a more or less up-and-down movement for the purpose of direct crushing. The crushing and vertical shearing action of the dentition of the carnivore exemplifies this masticatory pattern in its purest form. Trituration is more involved and requires that the mandible be depressed and moved to one side as the lateral shearing action of the cusps is brought into play. The pattern of mastication of the herbivore characterizes this action.

For simplicity in further discussion, the up-and-down direct crushing action will be referred to as a "chopping" movement. The triturating action involving lateral mandibular movements will be noted as "grinding."

All electromyographic recordings were preceded by careful clinical examination and rehearsal of the desired movements. During the electrical recordings the subject was observed closely to verify the proper execution of the movement under study.

As each subject permitted, the following movements of the mandible were observed, rehearsed and recorded under observation:

1. Resting activity. The subject was comfortably seated in a plain-backed chair and advised to relax. The sound amplifier was useful in this respect as the patient could hear the sounds made by the contracting muscles.

2. Passive movement. Obtained entirely through manual manipulation by the observer and without the assistance of the subject.

3. Mild occlusion. The teeth were held in centric occlusion but without any force being exerted.

4. Forced occlusion. The teeth were in centric occlusion under maximal contraction.

5. Jaw-jerk reflex. The stretch reflex was elicited by tapping on the point of the chin.

6. Resistive movements. The subject attempted to move his jaw either in the opening, closing, protrusive, retrusive or lateral movements against manual resistance.

7. Chewing. The subject was instructed to chew gum first in one buccal segment, then the other, and finally in the incisal area only. Currently, foods of various consistency are being tested in relation to the innervational activity elicited during mastication.

8. Masticatory stroke. As noted earlier, two kinds of jaw movement were recognized. First, the free swinging movements wherein no occlusal contact was made. Thus the subject moved his jaw in any of six positions, left or right, protrusive or retrusive, open or closed. These movements were performed both slowly and quickly. The second and more interesting movement involved definite occlusal contact. The subject was instructed to move his jaw into the incisive position and slide into centric occlusion while gritting his teeth. The movement of the jaw was then repeated beginning from centric position and sliding into a position of incision.

The lateral excursion, performed while keeping the teeth in sliding contact under force, bears detailed explanation. In an individual with an ideal occlusion, especially where no extremes of cuspid overbite exist to prevent lateral excursion, two positions at the extreme of the lateral

15. O'Rourke, J. T. Oral physiology, ed. by Miner, L.M.S. St. Louis, C. V. Mosby Co., 1951, p. 54.

movement may be observed. The first is that in which the greater part of the buccal segment is in edge-to-edge contact along the buccal cusps. The second, and more extensive lateral movement, usually involves a single contact on the cuspids only. Therefore in our electromyographic observations, the patient was carefully instructed to recognize these two positions of contact to permit differentiation in the extent of the lateral excursive movement in the recordings.

9. Gnathodynamometer recordings. The patient was requested to exert slowly increasing tension on the gnathodynamometer at various points in the dental arch while an electromyogram was obtained. The tension in pounds was recorded on the electromyogram by the operator.

DATA

Surface electrodes and the inkwriter recorder were employed in each of the following instances. The data were selected from our records to indicate the scope of present studies:

Chewing Patterns—Normal Occlusion • The masticatory movements of a young adult were obtained while chewing a single stick of gum (Fig. 3). No instructions were given the patient as to the manner of chewing except that he confine the bolus first to the one buccal segment, then the other, and finally to chew entirely between his incisors. The crystographic inkwriter recorded the simultaneous activity of the left masseter muscle and the three bellies of the left temporal muscle. While the subject was chewing on the same side, all four channels exhibited a synchronous discharge in time with each masticatory stroke. However, when the subject chewed on the right side, the electrical discharges, though still synchronous, revealed several differences. The action potentials from the masseter muscle were greatly diminished in number and in amplitude. On the other hand, the action potentials recorded from the posterior fibers of the temporal muscle showed a marked increase in amplitude. A slight increase was observed in the activity of the middle fibers while the activity of the anterior

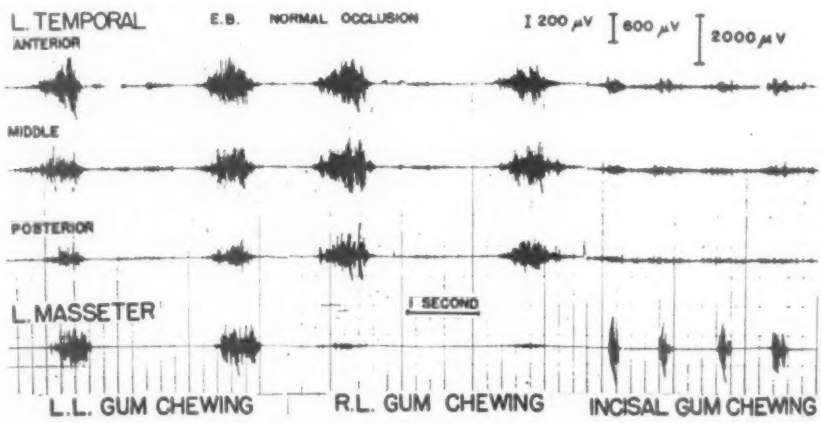


Fig. 3 • Three excerpts from the record of an individual with good occlusion while chewing gum

fibers of the temporal muscle remained unchanged.

During incisal chewing, the activity of the masseter muscle was characterized by short bursts of high amplitude. This was consistent with the ballistic character of the incisive stroke as compared with the slower, more deliberate grinding, and hence longer lasting, lateral masticatory movement. All three leads from the temporal muscle recorded action potentials of diminished amplitude during incisive chewing.

The pattern of the record was unchanged when the procedure was repeated while recording the contractions of the muscles on the opposite side.

Interpretation • It should be noted that no impediments existed in this subject's occlusion to prevent a smooth lateral stroke from side to side. The asymmetrical contraction patterns observed while chewing on one side suggest differences that reflect the postural changes of the temporomandibular articulation. The contralateral muscles function to stabilize the mandible while the ipsilateral musculature is in a position to exert maximal tension. The direction of pull exerted by the posterior fibers of the temporal muscle is such as to act antagonistically to the action of the external pterygoid muscle. In chewing on the right side, the condyle on the left side is moved forward by the external pterygoid muscle. It is conceivable that at this point the function of the posterior fibers of the temporal muscle is to stabilize or break the forward movement of the joint by the external pterygoid muscle. In fact, no other muscle fibers are so well disposed to oppose the action of the external pterygoid muscle.

Chewing Patterns — Class III (Angle) Malocclusion • In this instance (Fig. 4) the pattern of chewing was unchanged by switching the bolus from one buccal segment to the other. Occlusal interferences rendered this subject incapable of performing lateral excursive movements. In effect his bite was locked and all chewing strokes were characterized by "chopping" or vertical movements of the mandible. This pattern was not patho-

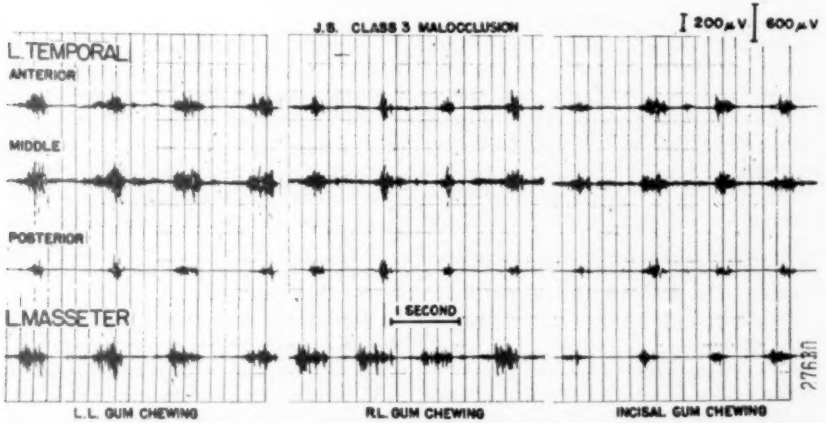


Fig. 4 • Three excerpts from the record of an individual with a malocclusion while chewing gum

movement may be observed. The first is that in which the greater part of the buccal segment is in edge-to-edge contact along the buccal cusps. The second, and more extensive lateral movement, usually involves a single contact on the cuspids only. Therefore in our electromyographic observations, the patient was carefully instructed to recognize these two positions of contact to permit differentiation in the extent of the lateral excursive movement in the recordings.

9. Gnathodynamometer recordings. The patient was requested to exert slowly increasing tension on the gnathodynamometer at various points in the dental arch while an electromyogram was obtained. The tension in pounds was recorded on the electromyogram by the operator.

DATA

Surface electrodes and the inkwriter recorder were employed in each of the following instances. The data were selected from our records to indicate the scope of present studies:

Chewing Patterns—Normal Occlusion • The masticatory movements of a young adult were obtained while chewing a single stick of gum (Fig. 3). No instructions were given the patient as to the manner of chewing except that he confine the bolus first to the one buccal segment, then the other, and finally to chew entirely between his incisors. The crystographic inkwriter recorded the simultaneous activity of the left masseter muscle and the three bellies of the left temporal muscle. While the subject was chewing on the same side, all four channels exhibited a synchronous discharge in time with each masticatory stroke. However, when the subject chewed on the right side, the electrical discharges, though still synchronous, revealed several differences. The action potentials from the masseter muscle were greatly diminished in number and in amplitude. On the other hand, the action potentials recorded from the posterior fibers of the temporal muscle showed a marked increase in amplitude. A slight increase was observed in the activity of the middle fibers while the activity of the anterior

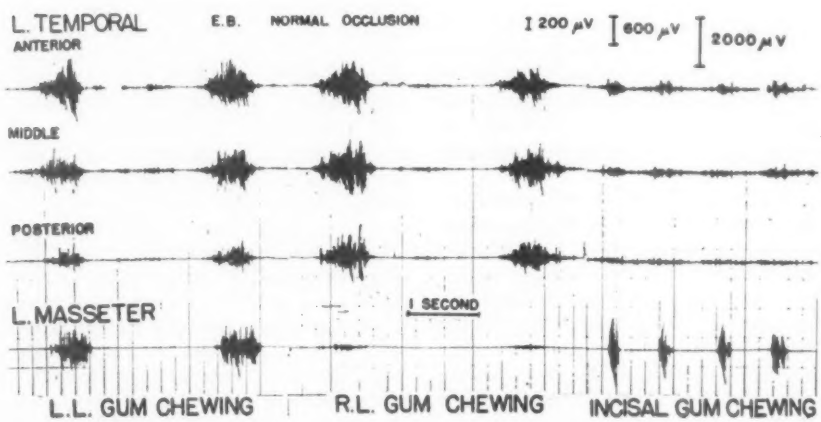


Fig. 3 • Three excerpts from the record of an individual with good occlusion while chewing gum

fibers of the temporal muscle remained unchanged.

During incisal chewing, the activity of the masseter muscle was characterized by short bursts of high amplitude. This was consistent with the ballistic character of the incisive stroke as compared with the slower, more deliberate grinding, and hence longer lasting, lateral masticatory movement. All three leads from the temporal muscle recorded action potentials of diminished amplitude during incisive chewing.

The pattern of the record was unchanged when the procedure was repeated while recording the contractions of the muscles on the opposite side.

Interpretation • It should be noted that no impediments existed in this subject's occlusion to prevent a smooth lateral stroke from side to side. The asymmetrical contraction patterns observed while chewing on one side suggest differences that reflect the postural changes of the temporomandibular articulation. The contralateral muscles function to stabilize the mandible while the ipsilateral musculature is in a position to exert maximal tension. The direction of pull exerted by the posterior fibers of the temporal muscle is such as to act antagonistically to the action of the external pterygoid muscle. In chewing on the right side, the condyle on the left side is moved forward by the external pterygoid muscle. It is conceivable that at this point the function of the posterior fibers of the temporal muscle is to stabilize or break the forward movement of the joint by the external pterygoid muscle. In fact, no other muscle fibers are so well disposed to oppose the action of the external pterygoid muscle.

Chewing Patterns — Class III (Angle) Malocclusion • In this instance (Fig. 4) the pattern of chewing was unchanged by switching the bolus from one buccal segment to the other. Occlusal interferences rendered this subject incapable of performing lateral excursive movements. In effect his bite was locked and all chewing strokes were characterized by "chopping" or vertical movements of the mandible. This pattern was not patho-

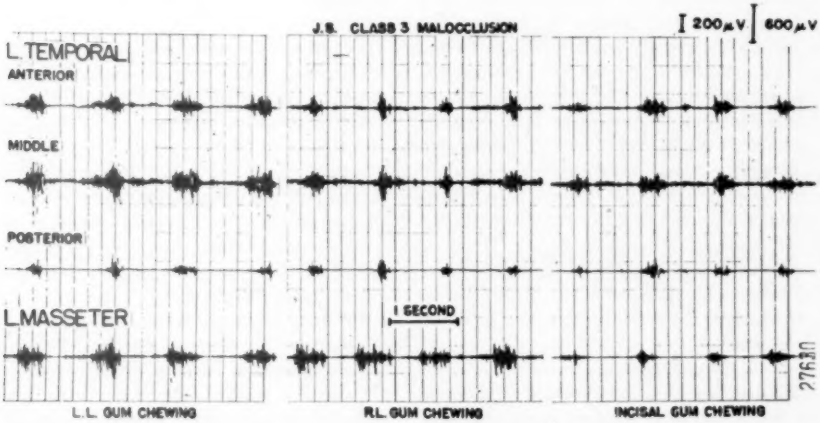


Fig. 4 • Three excerpts from the record of an individual with a malocclusion while chewing gum

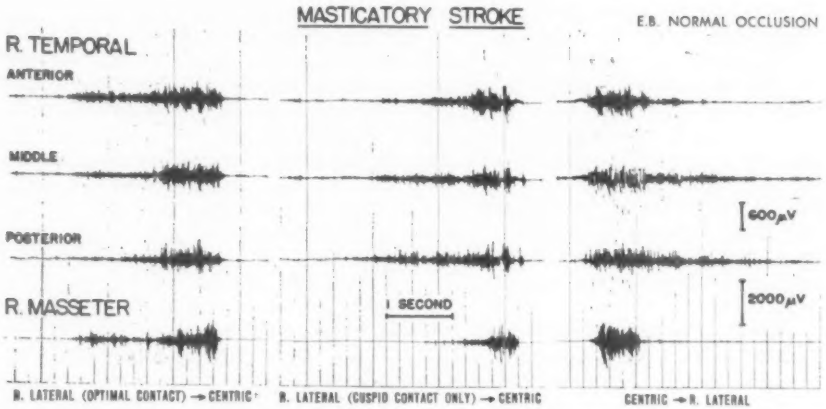


Fig. 5 • The lateral masticatory stroke in an individual with good occlusion

gnomonic for Class III malocclusions but was obtained wherever the individual was incapable of performing lateral excursive movements under occlusal stress. Our records include individuals with good occlusion who are incapable of performing any chewing movement in their buccal segments other than a straight up and down chopping stroke. Such instances are characterized by a deep overbite in the cuspid region. The form and position of the upper cuspid impede a free lateral stroke. On the other hand, individuals with the most obvious malocclusions but without any impediment to the lateral stroke exhibited the chewing pattern recorded in the individual with a normal occlusion. The difference in the chewing pattern shown in the two subjects (Fig. 3 and 4) is not a difference between a good and a bad occlusion. The difference lies in the ability or inability to perform a lateral masticatory stroke.

Masticatory Stroke—Normal Occlusion • Beginning at a point of optimal lateral contact, wherein the buccal cusps of the upper and lower posterior teeth were in edge-to-edge contact, the subject was instructed to slide his jaw into centric occlusion while maintaining tight occlusal contact (Fig. 5). The same movement was repeated but this time the initial contact was at a point of greater abduction wherein the cuspids were the only teeth in occlusal contact. Finally, this movement was reversed from centric occlusion to that of extreme lateral excursion.

From the electromyogram it is apparent that when optimal contact is obtained, as compared with cuspid contact only, a greater amount of electrical activity is obtained from the masseter muscle during the early phases of the stroke. All four channels reveal a gradual increment in the electrical output as centric occlusion is achieved. A mirror image of this picture is obtained as the movement is reversed.

Differences in the timing of maximal innervational activity of the muscles under analysis are further emphasized in the incisive stroke (Fig. 6). As before, maximal voltages were recorded from all leads as the masticatory stroke approached centric occlusion.

Interpretation • It has been demonstrated in the cat that proprioceptive sensations derived from the oral mucosa and periodontal membrane may act to regulate the force exerted by the elevators of the mandible.[16] It is entirely logical to assume that similar sensory and proprioceptive phenomena prevail in man. Thus the relative decreased activity of the masseter muscle when occluding on the cuspids only is entirely expected as a means of self protection. The relatively greater activity of the ipsilateral middle and posterior fibers of the temporal muscle during the extreme lateral movement may be attributed to their possible role in retracting the condyle.

In the initial phases of the incisive stroke, the anterior and middle fibers of the temporal muscle, by virtue of their directional pull in relation to the occlusal plane, are capable of contributing to the force of incision. The posterior fibers become activated as the mandible is retracted in returning to centric occlusion.

The performance of the masticatory stroke by individuals with certain malocclusions and with full dentures appeared to differ from that illustrated earlier. The number of patients in these categories up to the present is too small to permit presentation of findings.

Increasing Resistance Recorded by Means of a Gnathodynamometer • The skeletal muscle responds to an increased work load in two ways: (1) each motor unit enters more frequently and (2) more motor units are recruited. The repetitive firing of an individual motor unit may be recognized during a minimal muscle contraction by the distinguishing

16. Corbin, K. B., and Harrison, F. Function of mesencephalic root of fifth cranial nerve. J. Neurophysiol. 3:423 (Sept.) 1940.

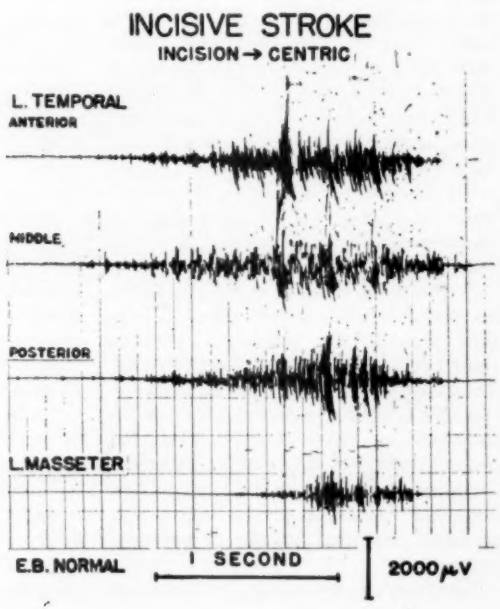


Fig. 6 • The incisive stroke in an individual with good occlusion

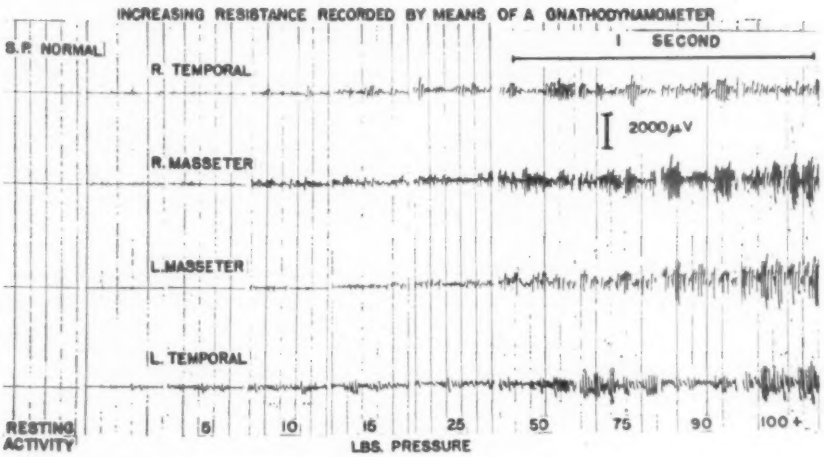


Fig. 7 • Multiple excerpts from the record of an individual with good occlusion while slowly increasing occlusal force on a gnathodynamometer

characteristics of the individual wave form. Recruitment creates an interference pattern masking the individual wave form because additional motor units fire out of phase with each other. As noted earlier, two or more motor units firing simultaneously yield a summated wave form of greater amplitude and time base.

To demonstrate the innervational activity of the temporal and masseter muscles with increasing tension, an electromyogram was obtained while the subject gradually exerted increasing forces on a gnathodynamometer (Fig. 7). The time interval was sufficiently long to record the gradually increasing tensions. To accustom the subject to the task, he was encouraged to practice with the instrument and acquire confidence and the proper timing. As the subject increased the force on the instrument, a technician noted the tension, in pounds, which was promptly recorded on the electromyogram.

Simultaneous recordings, by means of paired surface electrodes, were obtained from both temporal and masseter muscles. The gradual increase in the frequency and amplitude of the potentials was clearly noted. At the interval when 90 pounds pressure was recorded, there was a momentary decrease in the amplitude of the action potentials obtained from the left temporal muscle. Recovery with subsequent increase in amplitude quickly followed.

Interpretation • The phenomenon of momentary diminution in electrical activity from a single lead, with subsequent recovery, was observed in several instances. It is possible that during maximal effort a single muscle may relax momentarily in order to recover. This rotation in maximum effort among a muscle group may be nature's way of conserving its energies while maintaining reserve strength.

Bulbar Poliomyelitis • About four years prior to the electromyographic examina-

tion, this 14 year old boy suffered an acute illness. The history and course of this illness were consistent with a diagnosis of bulbar poliomyelitis. Clinical examination disclosed that the muscles of mastication on the right side were the only muscles with residual impairment of function. No other muscles in his body were affected. In opening his mouth, the jaw deviated to the right. Electrodiagnostic tests revealed a partial reaction of degeneration of the right masseter muscle and an almost total reaction of degeneration of the right temporal muscle. The left temporal and masseter muscles yielded normal responses to electrical stimulation.

Simultaneous recordings from both temporal and masseter muscles were obtained by means of paired surface electrodes. The differences in the amplitude of the action potentials confirmed the clinical and electrodiagnostic findings (Fig. 8).

It is of therapeutic importance to prescribe resistive exercises to maintain the functional health of partially paralyzed muscles and to reinforce stimuli to partially affected motor neurons. To determine which isometric contractions might elicit the maximal innervational activity in the affected muscles, the patient was instructed (1) to occlude his jaws in centric position under maximum effort, (2) to occlude his jaws in right lateral position under maximum effort, and (3) to occlude his jaws in left lateral position under maximum effort. During this isometric contraction simultaneous recordings of the temporal and masseter muscles were obtained (Fig. 9). The relative amplitudes from all four leads remained unchanged with respect to centric and right lateral occlusion. In left lateral

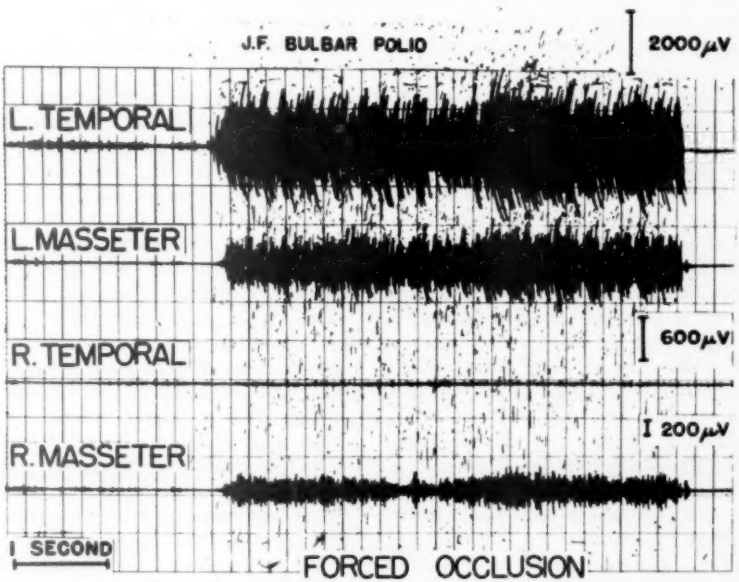


Fig. 8 • The residual asymmetrical effects of an attack of bulbar poliomyelitis

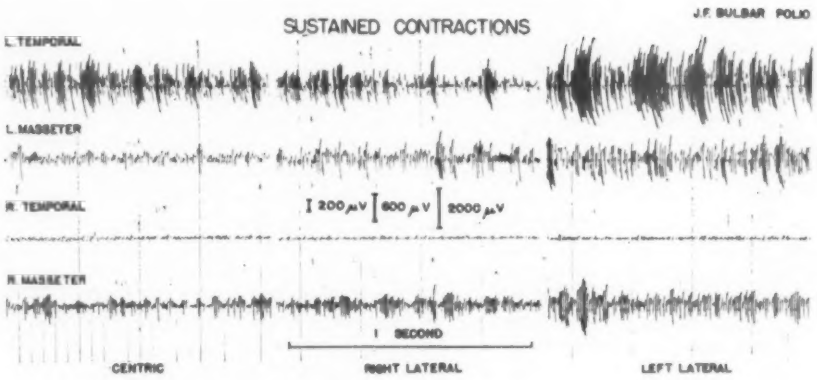


Fig. 9 • Note variations in the innervational activity of the right masseter muscle

occlusion, the leads from the normal temporal and masseter muscles recorded a definite increase in their electrical activity. The affected right temporal muscle continued to register action potentials of very low amplitude while the partially affected right masseter muscle revealed a definite increase in its innervational activity.

Interpretation. • Unilateral occlusion is a mass movement pattern involving synergistic activities of the muscles on both sides of the jaw. The muscles contralateral to the side in occlusion contribute a stabilizing effect on the mandible. Thus all movements of the mandible are mass movement patterns involving the muscles on both sides. Maximal stimulation of this pattern results in maximal activity of all the participating muscles including those muscles concerned with fixation or stabilization. Evidently a central excitatory state of a magnitude sufficient for the maximal stimulation of the paralyzed right masseter muscle was obtained when the patient occluded on the left side. Whatever the explanation may be, it is apparent from the record that the electromyogram was useful in establishing the exercises capable of eliciting the maximal contraction of the weaker masseter muscle.

Mass movement patterns are known and are effectively employed as therapeutic measures in the practice of physical medicine and rehabilitation in cases of this sort.

Tumor of the Gasserian Ganglion • A 57 year old woman complained of severe pain on the right side of her face which had persisted three years. The pain became worse despite various alcohol injections. Neurologic examination revealed complete palsy of the right fifth nerve and weakness of the masseter muscle. The electromyogram (Fig. 10) was obtained simultaneously from the right and left masseter muscles by means of paired surface electrodes. The patient was requested to close her jaws in centric occlusion as forcibly as possible. No occlusal impediments or deficiencies existed to prevent a symmetrical contraction. The electromyogram revealed significant differences in the amplitudes of the action potentials recorded from the right and left masseter muscles. In both instances an interference pattern was noted.

Interpretation • A large tumor in the area of the Gasserian ganglion, by extension and compression of the motor root of the trigeminal nerve, may produce muscle paralysis on the same side as well as sensory disturbances. The pressure block may be complete affecting conduction of impulses in all the axons of the motor root, or the block may be partial permitting transmission along a portion of the motor axons.

The decrease in amplitude indicated that fewer muscle fibers were in operation. The presence of an interference pattern in the affected side characterized the asynchronous discharge of the remaining motor units.

Parkinson's Disease • Clinically, this disease is characterized by muscular rigidity and coarse tremors at rest. It is associated with degenerative changes of the basal ganglia. The condition is often progressive with eventual appearance of the shaking palsy in the jaw and tongue. In the patient described, the tremor involved the tongue and jaw as well as muscles in the extremities. The tremor frequency is approximately six per second. It disappears on volitional contraction and appears to be inhibited by the contraction of antagonistic muscle groups.

Paired surface electrodes were placed on each of the temporal and masseter muscles and simultaneous recordings were obtained (Fig. 11). Curiously enough only the right temporal muscle was involved. The electromyogram obtained with the subject at rest revealed electrical silence in the left temporal muscle and both masseter muscles. The right temporal muscle exhibited the characteristic tremor rate. A free swinging movement of the mandible to the left inhibited the tremor. The other leads demonstrated electrical activity during this movement. An excursion of the mandible to the right diminished the discharge from the muscles on the left side while increasing the activity in the right masseter muscle. Superimposed on the tremor in the right temporal muscle were the action potentials produced by the volitional activation of the involved muscle during this excursion of the mandible.

The wide open position of the mandible also inhibited the tremor in the right temporal muscle. Rapid closure of the jaw produced simultaneous bursts of ac-

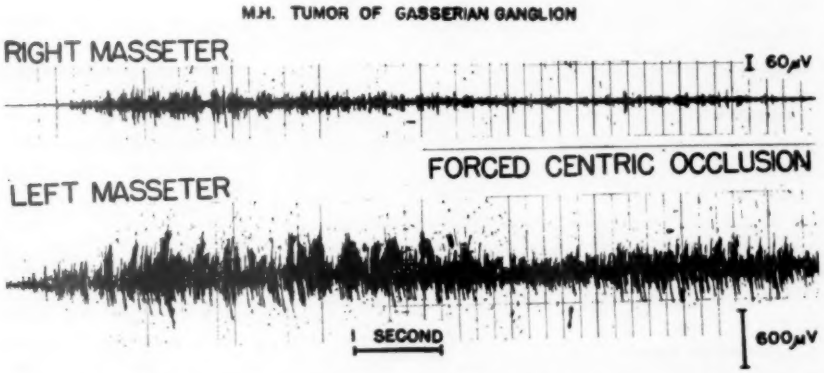


Fig. 10 • Effects of a tumor mass in the vicinity of the motor root of the trigeminal nerve on the right side

tivity in all four leads. The activity in the unaffected muscles was of short duration. The after discharge of action potentials in excess of the tremor pattern persisted for a while after the completion of the volitional act (Fig. 12).

Interpretation • This case not only demonstrates the pathophysiology of parkinsonism, which is well known, but also it may reinforce knowledge concerning the normal individual. The tremor observed when the muscles are at rest indicates the kind of activity of the affected muscle. The inhibition of the tremor may be due to reciprocal inhibition involving the contraction of an antagonist. If this is so, it indicates the reciprocal phenomena involved in various jaw movements. The abolition of the tremor during volitional activity of the involved muscle may be explained by the additive and superimposing effect of the volitional innervation of the muscle which masks the tremor pattern restoring smoothness to the contraction.

Myasthenia Gravis • This disease is characterized by excessive fatigability of the musculature. The muscles innervated by the bulbar nuclei are usually first and most seriously involved. "The usual story is that, while chewing, the patient experiences a tiring of the masseters so that toward the end of the meal it is impossible to chew solid food. Yet upon resting for a few moments, sufficient strength is recovered to resume for a while, but fatigue again rapidly sets in."[17] The disturbance in muscle contraction in myasthenia is caused by a neurochemical abnormality at the myoneural junction. Harvey and Masland[18] concluded that the reduction of amplitude of potential during repetitive stimulation gives evidence that fewer muscle fibers are activated by the second and by succeeding maximal shocks to the nerve than by the first.

The progressive decline of the amplitude of the action potentials obtained from the masseter muscles during a short

17. Grinker, R. R., and Bucy, P. C. Neurology, ed. 4. Springfield, Charles C Thomas, 1949, p. 927.

18. Harvey, A. M., and Masland, R. L. The electromyogram in myasthenia gravis. Bull. Johns Hopkins Hosp. 69:1 (July) 1941.

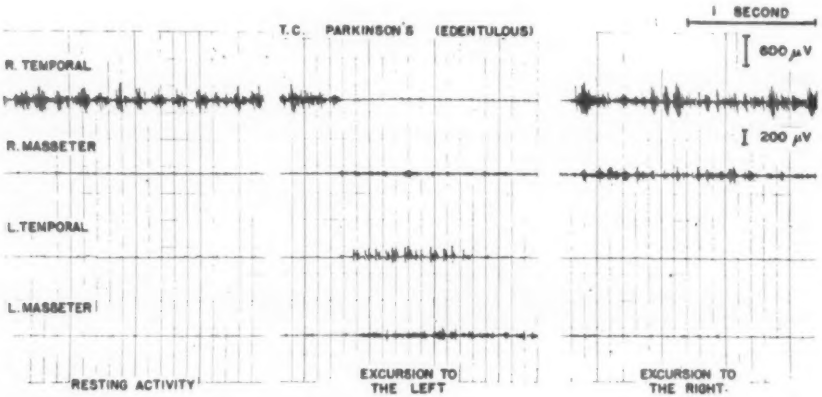


Fig. 11 • Parkinson's disease. Note inhibition of the tremor pattern in the right temporal muscle during left lateral excursion of the mandible

time interval is evident in the electromyogram (Fig. 13). The patient was instructed to chew rapidly. This accounts for the ballistic pattern of the action potentials. The onset of fatigue is delayed by the administration of prostigmine. The electromyogram may serve as a valuable method for quantitating the pharmacodynamic action of various drugs on the neuromuscular system.

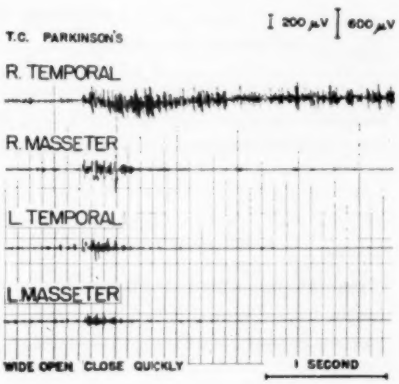


Fig. 12 • Parkinson's disease. Note after-discharge in the right temporal muscle

CLEFT LIP AND CLEFT PALATE

A large number of children with cleft lip and cleft palate are currently being studied[19] and it was felt that electromyography could be applied to some of the problems encountered in these anomalies. The characteristic varieties of malocclusion found in patients with cleft palate are being studied with reference to their chewing patterns. In addition, an electromyographic analysis of the complete, symmetrical, bilateral cleft lip is now in progress. Records are being obtained prior to and following surgical correction in the same individual.

DISCUSSION

The findings presented are indicative of work now in progress. Definite conclusions regarding the significance of the data should await further documentation. However, certain observations are sufficiently significant to warrant discussion at the present time.

On the basis of clinical examination, the masticatory movements of certain individuals may characterize them as "grinders" or "choppers." The difference lies in the ability to execute lateral shearing movements of the mandible. The "grinder" can perform this movement while the "chopper" cannot. During gum chewing in the buccal segment, differences were observed in the electromyographic patterns which differentiated the "grinder" from the "chopper." These electromyographic differences pose several questions. First, does the "chopper" expend more muscular energy in chewing and if so, does he possess a less efficient mechanism. Secondly, will the electromyographic pattern change in the comminution of foods of varying physical consistency. Finally, can the electromyogram provide a measure of masticatory efficiency.

The recent addition of an integrator to our inkwriter, for summating the electrical activity during a given time interval, may prove valuable in assessing the innervational activity of the muscles in the performance of masticatory work.[20] To determine the work done, electromyographic studies should be coupled with the analytical methods devised by Manly.[21]

Future plans include occlusal equilibration, in certain selected cases, to remove cuspal interferences and permit a wider

19. Pruzansky, S. Serial growth study of newborns with cleft lip and cleft palate. Unpublished.

20. Kendell, H. W., and others. Unpublished data.

21. Manly, R. S., and Braley, L. C. Masticatory performance and efficiency. J. D. Res. 29:448 (Aug.) 1950.

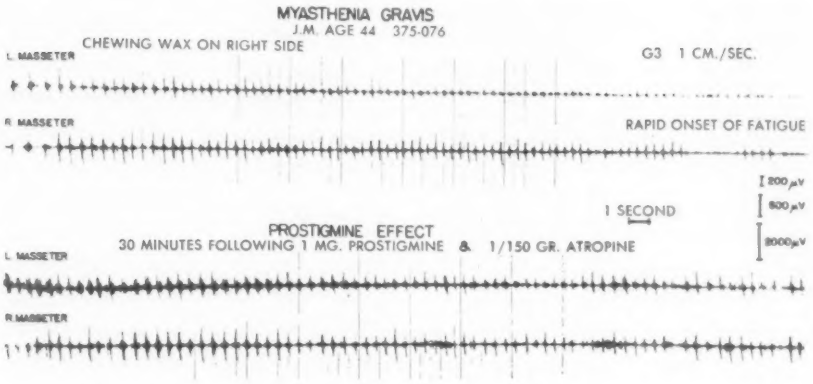


Fig. 13 • Myasthenia gravis. Rapid onset of fatigue characterized by progressive decrease in the amplitude of the action potentials. Note favorable effect of prostigmine

lateral stroke. If the electromyographic pattern can be changed by such measures, the validity of the interpretations may be enhanced.

During forceful centric occlusion of the jaws, the masseter muscle and the three bellies of the temporal muscle contract simultaneously, yielding action potentials of high amplitude. In the masticatory stroke maximal activity of the temporal and masseter muscles is not achieved until the subject's jaws approach centric occlusion (Fig. 5 and 6). The peak of this force or the "moment of force" seems to have an additional dimension, in terms of its duration. Chopping strokes tend to be ballistic in nature; that is, the moment of force is of shorter duration. Broad masticatory strokes that permit trituration of the bolus present moments of force that are of longer duration. These differences in the moment of force were observed when gum chewing in the incisal segment was compared with gum chewing in the buccal segment (Fig. 3). The "chopper" by virtue of his locked bite is less capable of triturating movements than the subject with a free lateral stroke. This difference is manifest in the duration of their respective moments of force while chewing gum in either buccal segment (Fig. 3 and 4). It is clear that the moment of force is of longer duration where trituration is most feasible. This, too, may provide an additional insight into the factors controlling masticatory efficiency.

The analysis of the masticatory stroke performed under occlusal stress, even in the absence of a bolus of food, may yield valuable information. It is precisely such movements that concern the periodontist relative to occlusal equilibration The prosthodontist assesses these movements in relation to his plan of treatment. The stability of newly established occlusal relations as a result of orthodontic treatment is dependent, in part, on the forces attending functional jaw movements.

The study of pathologic conditions affecting muscular function is important for the insight it provides into normal physiologic mechanisms. The muscles of mastication fall heir to many of the neuromuscular diseases that affect muscles elsewhere in the body. Observations confirm the belief that the basic laws of neu-

romuscular physiology prevailing for muscles elsewhere in the body hold equally true for the jaw muscles.

The value of electromyography to the study of functional anatomy is obvious. The true dynamic action of the muscle in relation to its various synergies can now be established in the living creature.

As a means of controlling electromyographic research and verifying the validity of the observations, supplemental records in the form of cephalometric headplates and laminagrams are obtained whenever they may prove of value. In this connection the dynamic studies by Thompson, Brodie, and Ricketts[22, 23, 24] have provided a valuable background for these findings. The multidimensional approach to kinesiologic studies provided by the concurrent use of roentgenography and electromyography is least subject to error or misinterpretation.

Whenever the clinical sciences acquire a new tool for research, enthusiasm for the instrument often overshadows the realities of accurate observation. To avoid such pitfalls it is well to remember Denny-Brown's[25] comments on Sherrington's methods, "direct vision and palpation served always to control the caprice and artifice of delicate apparatus." Clinical observation coupled with a knowledge of the possibilities and limitations of electromyography are essential to research in this field. Research should serve to enhance the art of simple observation. What has been recorded in the electromyogram has served to sharpen and stimulate direct clinical observation.

SUMMARY

There is a need for research into the neuromusclar mechanisms controlling mastication and the possibilities of employing electromyography as an instrument in clinical research are numerous. An outline of the method and the armamentarium required for electromyography has been presented.

Present research efforts are directed toward mapping the electromyographic patterns of the facial muscles, including the muscles of mastication, in normal and pathologic conditions in man. Toward this purpose, normal individuals at various ages, as well as subjects with malocclusions and a variety of neuromuscular disorders have been studied and the patterns mapped.

The most striking observations thus far concern the electromyographic patterns of mastication noted in a variety of individuals. These differences may provide an insight into some of the factors governing masticatory efficiency.

Studies in patients with brain tumor, Parkinson's disease, bulbar poliomyelitis, and myasthenia gravis were, in part, representative of the variety of lesions that may strike at different levels of neuromuscular control. The observations in these instances revealed that the muscles of mastication are susceptible to the same disorders affecting muscles elsewhere in the body. Moreover, the pathologic findings, as revealed in the electromyogram, are similar to those described for the muscles of the extremities.

The value of electromyography has been demonstrated in prescribing therapeutic exercises to suit the needs of the individual patient. Such exercises may assist in the rehabilitation of patients affected by poliomyelitis or cerebral palsy.

CONCLUSIONS

1. Electromyography offers promise of useful application to areas of dental re-

22. Thompson, J. R. A cephalometric study of the movements of the mandible. J.A.D.A. 28:750 (May) 1941.

23. Thompson, J. R., and Brodie, A. G. Factors in the position of the mandible. J.A.D.A. 29:925 (June) 1942.

24. Ricketts, R. M. Variations in the temporomandibular joint as revealed by cephalometric laminagraphy. Am. J. Orthodont. 36:877 (Dec.) 1950.

25. Denny-Brown, D. Selected writings of Sir Charles Sherrington. New York, Paul B. Hoeber, 1940, p. 7.

search that are largely unexplored.

2. The synergistic behavior of the muscles of mastication in certain functional movements of the mandible has been demonstrated. The patterns of synergistic behavior differed with respect to various disturbances in occlusion. These differences may be correlated with the efficiency, or lack of efficiency, of the masticatory mechanism.

3. Electromyographic findings in neuromuscular disturbances involving the muscles of mastication were described. The pathologic findings, in terms of the electromyogram, were similar to those reported for muscles elsewhere in the body.

Ankylosed deciduous molars

Jack M. Vorhies, D.D.S.; G. Thaddeus Gregory, D.D.S., and Ralph E. McDonald, D.D.S., Indianapolis

Osseous ankylosis of deciduous molars, a problem which on the surface might seem a minor one, should receive much more consideration from the dental profession. This condition has been referred to inaccurately as "submerged molars." This term is objectionable because it seems not to take into account the existence of continuous bone growth and tooth eruption and the static retention of the ankylosed tooth in the arch.

The deciduous tooth which is most commonly found to be ankylosed is the mandibular second molar.[1] Occasionally the first deciduous molar is involved. The condition is seen less frequently in the maxillary arch. When it does occur it is usually accompanied by a similar condition in the lower arch. The ankylosis may be unilateral or bilateral and while it is usually seen in children with mixed dentitions it will occasionally be seen in the preschool child. If the teen-age child has not appeared regularly for examination or treatment, it may be observed at that stage of dental development. It is more rarely seen in persons in their twenties, and when present is usually in conjunction with the absence of its permanent successor.

The diagnosis of ankylosed deciduous molars is not difficult. Whenever one or more opposing deciduous molars are no longer in occlusion, they should be immediately suspected as being ankylosed. The tooth is out of occlusion by variable dimensions because of the absence of growth of the alveolar process and continuous eruption of the tooth (Fig. 1). Frequently, the adjacent teeth will have axial inclinations which converge and seemingly block out the ankylosed tooth (Fig. 2, left). Mobility is entirely lacking in these teeth, even when the roentgenogram demonstrates advanced root resorption. If the condition has gone unobserved

From the departments of pedodontia and oral surgery, Indiana University School of Dentistry.

1. Brauer, J. C. Dentistry for children. With special chapters by Higley, L. B., and Boyd, J. D. Philadelphia, Blakiston Co., 1939, p. 110.

or untreated for an extended period of time the entire tooth may be covered by soft tissue (Fig. 2, right). The latter condition can only be revealed by roentgenographic examination. The diagnosis of ankylosed teeth may be partially confirmed by using an instrument handle to tap on the occlusal surface of the suspected tooth. An ankylosed tooth will have a solid sound on percussion, giving the impression that the tooth is an integral part of and fused to the skull. Conversely the normal tooth on percussion will have a cushioned or dull sound.

Fig. 1 • Dentition of a boy, aged 9, having a quadrilateral ankylosis of all deciduous molars. The left first molars lack occlusal contact by 7 mm.

ROENTGENOGRAPHIC DIAGNOSIS

The roentgenogram will be of material aid in completing the diagnosis of ankylosis. Normally the periodontal membrane will appear as a narrow radiolucent, unbroken line following the outline of the roots of the teeth. This is not true in ankylosis since an absence of a continuous periodontal membrane may be significant. Certain areas may show sclerotic osseous tissue with other areas showing a moth-eaten appearance or an intact membrane.

A condition of ankylosis may occur in the absence of permanent successors to the deciduous tooth. In these cases, the roots of the deciduous teeth may be intact and ankylosed, or, as in some cases, the roots may be almost resorbed with a persisting ankylosis (Fig. 2, left). This fact alone lends merit to the theory that something besides, or in addition to, pressure is necessary for physiologic resorption. Initially the absence of the continuous fine periodontal membrane is noticed on segments of the roots, and as time passes the osseous structure is more difficult to distinguish from the tooth structure. If the bicuspid is present, its position will vary. It may be in a natural position, depending upon the amount of root growth, or at later periods, it may commonly be seen in a semihorizontal position, usually toward the mesial (Fig. 3) or in some cases may be in torsiversion. In the maxillary arch, the root of the permanent tooth, if sufficiently developed, is likely to have a root and bone process extending into the maxillary sinus. In addition, the roentgenograms are likely to demonstrate a cystic condition, which is seen in some of these cases.[2] As in all other pathologic conditions, the ever present possibility of infection is not to be disregarded.

HISTOLOGY

The histological picture was first examined by Noyes, who has done an excellent and recognized study.[3,4] The picture, in general, is one of hyperactivity. The osseous ankylosis lies between dentin and

2. Dean, O. T. Submerged teeth. Washington D. J. 17:31 (Jan.) 1949.
3. Noyes, F. B. Submerged deciduous molars. Angle Orthodont. 2:77 (April) 1932.
4. Noyes, F. B. Case report of submerged deciduous molar. Angle Orthodont. 13:62 (July-Oct.) 1943.

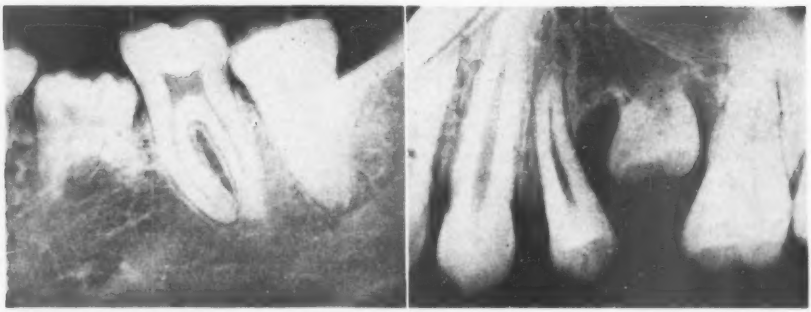


Fig. 2 • Left: The mesial tilt of the first permanent molars is particularly evident in the later stages. Congenitally missing permanent teeth are frequently associated with this condition. Right: Untreated ankylosed deciduous molars covered by soft tissue

bone and is carried on in close proximity with osteoclastic activity (Fig. 4, above left). In one area osteoclastic activity on old dentin is prevalent, and a few microns away osteoblasts are laying down osteoid tissue which is hyperplastic and is not entirely like alveolar bone. Where the one is being formed, the connective tissue is a dense fibrous type with columns of fibroblasts along the periphery. The resorption is carried on with an increased vascularity (Fig. 4, above right). Secondary dentin is rapidly consummated by odontoblasts at various periods, probably stimulated by the approaching osteoclastic activity. Periods of dentin formation and calcification, as well as the rebuilding of bone, are evident in histologic sections (Fig. 4, below). The persistence of the adjacent pulp tissue and its characteristic structure is especially noticeable. The picture appears to be one in which this double activity of resorption and osseous deposition seemingly bores through solid tooth structure leaving in its wake an atypical bone. It has been observed[4,5] that even enamel is vulnerable to the absorption process.

There are two principal theories attributed as the cause of this pathologic condition. One is mechanical and the other physiological. In effect the mechanical theory uses for its support the fact that the process is one in which the permanent teeth physically block out and submerge the deciduous teeth. In our opinion the tilting and malposition of the teeth is one of effect, not cause, due to the disengagement of the balance of the arch and its bony support.

As for the direct physiologic cause of ankylosis, very little can be said at the

Fig. 3 • In most instances in the later stages of eruption the permanent teeth will have a mesial inclination, failing to erupt or erupting ectopically

5. Skillen, W. G., and Walley, G. A. C. Submerged deciduous molars. Northwest. Univ. Res. & Grad. Quar. Bul. 38:17 (Nov. 1) 1937.

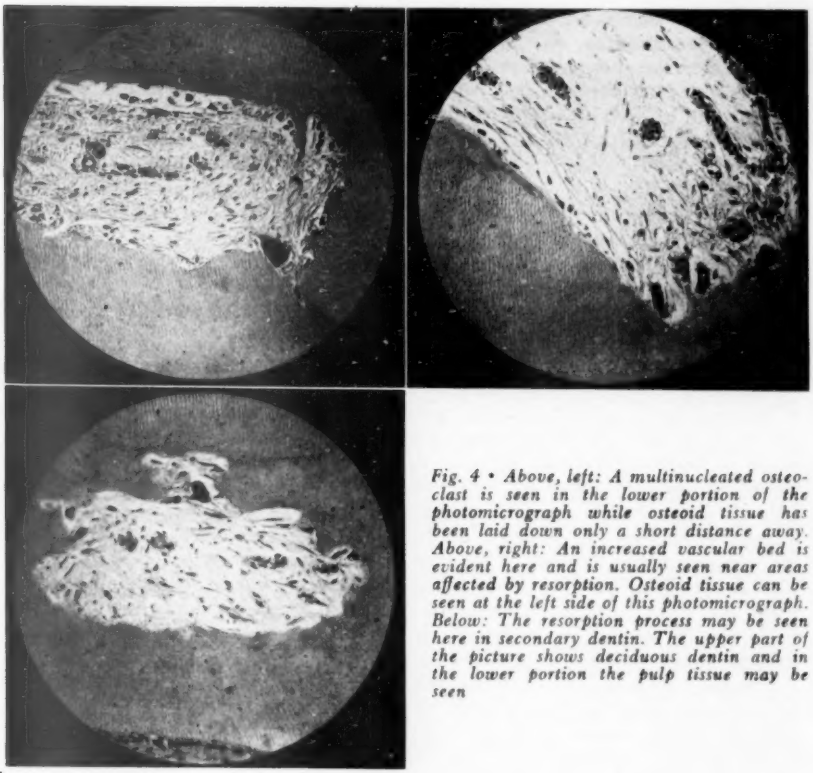


Fig. 4 • Above, left: A multinucleated osteoclast is seen in the lower portion of the photomicrograph while osteoid tissue has been laid down only a short distance away. Above, right: An increased vascular bed is evident here and is usually seen near areas affected by resorption. Osteoid tissue can be seen at the left side of this photomicrograph. Below: The resorption process may be seen here in secondary dentin. The upper part of the picture shows deciduous dentin and in the lower portion the pulp tissue may be seen

present time. However, it is agreed that a vital cementum is necessary for a fibrous union of a tooth in its socket. If the cementum is destroyed through resorptive processes and is not replaced, an osseous union is feasible with the dentin. Kronfeld[6] quotes Tomes:

> The process of absorption once commenced does not necessarily proceed without intermission but may give place for a time to actual deposition of osseous tissue on the very surface eroded. . . . These alterations of absorption and deposition . . . often occur during the normal process of the removal of deciduous teeth, and result in the deposition of a tissue not unlike cementum in excavations of the dentin or even the enamel.

TREATMENT AND PROGNOSIS

The paramount principle in these cases is the early recognition and treatment, the usual treatment being surgical removal. If these teeth are not removed at an early date they may eventually be covered by soft tissue. In those instances where ankylosis occurs late in the life of the deciduous tooth and growth of the jaws is approaching its later stages, complete coverage of the tooth is not so likely;

6. Kronfeld, Rudolf, Histopathology of teeth and their surrounding structures, ed. 2. Philadelphia, Lea & Febiger, 1939. p. 267.

however, the stage is set for an increase in caries susceptibility. As the adjacent teeth or even the opposing teeth continue their eruption, normal proximal contact is lost. This offers a favorable situation for the caries process. Thus, not only the permanent and remaining deciduous teeth are endangered by caries but, because of the inclination of the permanent teeth, food impaction and consequent periodontal complications can be expected. Because of infection it is not uncommon for the permanent teeth on both sides of the ankylosed tooth to be lost.

During surgical removal it is advisable to remove the bone overlying the crown of the permanent tooth so that the tooth will erupt. If this bone is not removed it might be necessary in many instances to reopen the area in the event the tooth fails to erupt. In the maxilla the deciduous tooth, since it is fused to the bone, soon becomes the floor of the sinus and an opening into the sinus occurs when the tooth is removed. Ankylosed teeth usually cannot be extracted but must be removed surgically by dissection.

Lost space must sometimes be regained or remaining space maintained until the permanent tooth erupts, or until a fixed bridge has been constructed for patients where the bicuspid is congenitally missing. The space may be retained by using temporary acrylic partial plates or conventional cast gold space maintainers.

The drifting, tilting and exfoliation of the teeth as well as the lack of development of alveolar process in this area contributes to a malocclusion. If the permanent tooth is left below the ankylosed deciduous tooth, the danger of cystic formation or malposed successors is always present. In view of these facts, the most favorable prognosis may be secured by early recognition and treatment.

SUMMARY

1. The deciduous tooth most commonly ankylosed is the mandibular second molar.

2. Deciduous molars which are out of occlusion, immobile, with an incontinuous periodontal membrane, and which give a solid rather than a cushioned sound on percussion, should be suspected as being ankylosed.

3. The histological picture is one of resorption and osseous deposition. This is probably the result of the destruction of vital cementum through resorption and osseous deposition uniting alveolar bone with the dentin.

4. Early diagnosis and treatment is imperative and as a general rule the deciduous tooth should be removed as soon as diagnosed to prevent malocclusion and increased caries susceptibility.

5. Surgical removal rather than extraction is necessary in most instances since the roots are fused to the alveolar process.

The Armed Forces Medical Policy Council

Hilton W. Rose, M.D., Washington, D. C.

On January 2, 1951, the Secretary of Defense established in his office the Armed Forces Medical Policy Council and incorporated in it the functions previously assigned to the Armed Forces Medical Advisory Committee and the Office of Medical Services. The chairman of the Council serves as adviser and consultant to the Secretary of Defense on medical and health matters. The Council itself is charged with the responsibility of providing the Defense Department with broad basic policies, plans and programs in the medical and health field. It has the further responsibility of fostering to the maximum degree continuing cooperation and understanding between the civilian medical profession and the Armed Forces.

The Council combines in one organization leading military and civilian medical authorities. It is composed of a chairman, who must be a civilian doctor of medicine; the Surgeons General of the Army, Navy and Air Force, each of whom acts for and represents his respective department; and three civilian members, national authorities in medical and health fields, who are appointed by the Secretary of Defense. At the present time, the Council membership is as follows: W. Randolph Lovelace, II, M.D., chairman; George E. Armstrong, Major General (MC), U.S.A., Surgeon General; H. Lamont Pugh, Rear Admiral (MC), U.S.N., Surgeon General; Harry G. Armstrong, Major General (MC), U.S.A.F., Surgeon General; James P. Hollers, D.D.S.; Isidor S. Ravdin, M.D.; Alfred R. Shands, Jr., M.D. Dr. Hollers is a practicing dentist and past national president of the Reserve Officers Association. The members of the Council are shown in Figure 1.

The Council's staff is composed of three divisions (Fig. 2). The Planning Coordination Division provides the mechanics through which medical and health problems associated with the mobilization and the strategic and logistic planning agencies are coordinated. The coordination of uniform programs, joint utilization and cross-servicing of facilities and the general standardization of medical and health reports, records, technical procedures, and so forth, within the military departments are accomplished by the Military Affairs Coordination Division. Liaison between the Department of Defense and civilian medical and allied organizations and between the Department of Defense and international organizations involved in matters of mutual interest in the medical and health fields is effected through the Civil and Military Interrelations Division of the Council.

Through the efforts of the Council and its predecessor organization, the Office of Medical Services, real progress has been made in the last year toward the unification of the dental services of the Army, Navy and Air Force. This has served to

Captain (MC), U.S.N.; executive officer, Armed Forces Medical Policy Council, Office of the Secretary of Defense, Washington, D.C.

Fig. 1 • Left to right, are: Maj. Gen. Harry Armstrong, Isidor S. Ravdin, Maj. Gen. George E. Armstrong, W. Randolph Lovelace, II, Alfred R. Shands, Jr., James P. Hollers and Rear Admiral Herbert L. Pugh

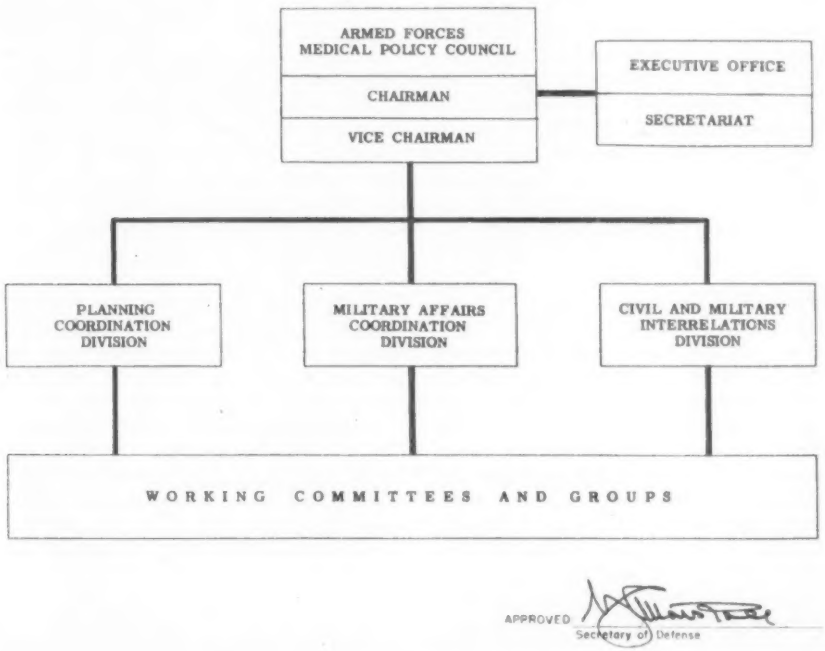


Fig. 2 • Armed Forces Medical Policy Council

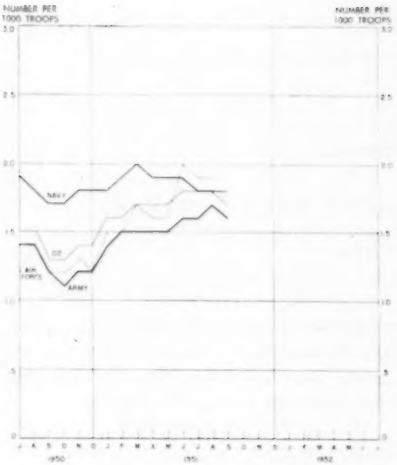


Fig. 3 • Ratio of dentists to troop strength by service (world-wide), from July, 1950 to September, 1951. The mean is shown by the dotted line. (DD—Department of Defense)

eliminate the former confusion which arose when personnel of one service received dental care from another service. For example, there is now uniformity in nomenclature and definitions used with respect to dental examinations and dental classification of individuals. Four types of dental examinations are used by the military departments: the ideal, the routine, the modified routine and the screening examination. As a result of these examinations, individuals of all three military departments are placed in one of five standard classes, ranging from Class 1, in which no dental treatment is required, to Class 5, in which emergency dental treatment is needed. Another important achievement of the Council has been the standardization of the "Dental Service Report" form which is now used by the Army, Navy and Air Force, and which replaces various reports previously employed. These accomplishments in unification have served to improve and increase the efficiency of the dental services in all three military departments.

There are approximately 6,000 dentists now on duty with the Armed Forces. A ceiling ratio of two dentists per thousand troops strength is currently applicable in all three military departments. Figure 3 shows the ratio of dentists to troop strength by service (world-wide) from July, 1950 to September, 1951. The ratio since September, 1951 has remained approximately the same.

Combined Operations • With the accelerating rate at which new knowledge is accumulating and with the increasing recognition that nature is of one piece, it becomes evident that the continued isolation of the several branches of science from one another is a serious obstacle to scientific progress. Nowhere in science is the need for "combined operations" more evident than in medicine. Today, to be effective, medical research and practice must embrace data from all of the disciplines. ***Journal of the American Medical Association 147:704, October 13, 1951.***

BUREAU OF ECONOMIC RESEARCH AND STATISTICS

Personal expenditures for dental services and other health care

Figures recently released by the U. S. Department of Commerce indicate that consumers paid $991,000,000 to dentists in 1950, an increase of 6.4 per cent over the previous year. As shown in Table 1, this is the most ever spent for dental care in a single year. This figure does not include governmental and philanthropic dental care; it is apparent, therefore, that the total dental bill for the nation in 1950 exceeded a billion dollars.

Per capita expenditures for dental care in 1950 were $6.60, based on the estimated total civilian population on July 1. The per capita dental care bill has grown steadily from a low of $2.20 in 1933 (Table 2 and Fig. 1). The Bureau has estimated that dentists see 60 million patients during a year.[1] The average dental bill per patient in 1950 would thus be approximately $16.50.

Obviously, some of the increased expenditures are accounted for by increases in fees. As was pointed out in an earlier article, dental fees in 1950 were approximately 54 per cent higher than the average for 1935-1939, according to the price index for dental care developed by the U. S. Department of Labor (the over-all cost of living rose about 72 per cent during the same period).[2] It should be borne in mind that the expenditure figures and the price indexes are not completely accurate. The price indexes are based on but two dental operations, fillings and extractions. The expenditure figures are estimated mainly from surveys of the incomes of dentists. In both cases figures are obtained from a relatively small number of dentists, presumably a cross-section of all dentists in private practice.

Within the limits imposed by the accuracy of these statistics, it is possible to determine the actual increase in the amount of dental care the average person received. When the per capita expenditures are divided by price indexes over 100, year by year, the result is per capita expenditures in terms of a stable dollar, the dollar of 1935-1939. Otherwise expressed, the result is a measure of the amount of dental service received relative to the amount received in the average year during the period 1935-1939.

Table 2 shows that per capita expenditures for dental care have almost doubled since 1935, even with fee increases ruled out. This is the same as saying that the amount of dental service per capita has almost doubled. It is true, however, that the amount of dental service per capita has remained almost constant since 1943. The amount was highest in 1946, when high income and shortages of goods tended to make money more available for dental care. Unfortunately, it is not possible to use this method to determine the amount of dental service rendered prior

1. Nineteen fifty survey of the dental profession. IV. The dentist's work year. J.A.D.A. 41:625 (Nov.) 1950.

2. Indexes of dentists' fees and other price indexes. J.A.D.A. 43:200 (Aug.) 1951.

Table 1 • Personal expenditures for health care, 1929-1950 (in millions of dollars)

	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950
Dentists	482	463	408	312	276	295	302	331	350	356	386	419	468	545	606	643	648	821	837	895	931	991
Physicians	959	924	819	661	617	678	731	820	854	833	866	913	991	1,072	1,112	1,289	1,342	1,658	1,946	2,141	2,267	2,376
Osteopathic physicians	41	38	34	27	26	28	30	33	36	40	43	47	57	61	64	74	79	87	102	109	113	119
Chiropractors	49	46	40	30	26	26	28	32	33	33	34	36	39	46	49	53	56	64	76	84	88	93
Chiropodists and podiatrists	20	19	17	14	13	13	14	15	15	14	15	17	18	22	23	25	27	30	36	40	42	44
Private duty trained nurses	113	104	88	67	59	63	64	68	67	61	59	58	58	62	67	75	79	87	97	104	109	114
Practical nurses and midwives	86	74	56	41	34	39	40	46	52	43	45	48	50	57	63	74	82	83	94	96	98	111
Miscellaneous curative and healing professions	27	26	22	16	14	15	15	17	17	15	16	18	19	23	25	28	29	33	36	39	40	41
Drug preparations and sundries	604	568	517	449	427	468	474	509	558	578	612	640	725	858	1,030	1,091	1,167	1,305	1,358	1,406	1,398	1,450
Ophthalmic products and orthopedic appliances	131	133	117	93	92	124	131	140	165	157	172	187	226	255	301	323	340	385	386	416	431	477
Privately controlled hospitals and sanitariums	403	404	395	386	363	369	406	422	454	467	492	527	555	649	752	846	925	1,163	1,394	1,585	1,723	1,955
Net payments to group hospitalization and health associations*	0	0	0	0	0	0	0	1	3	6	10	16	27	30	35	44	45	62	78	106	134	145
Student fees for medical care	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	4	4	4	4
Accident and health insurance—net payments	86	90	77	60	56	71	78	87	99	104	115	126	141	164	200	244	278	336	362	402	438	477
Mutual accident and sick benefit associations—net payments	20	18	13	10	12	12	13	16	19	22	26	22	25	33	38	41	48	48	60	55	57	57
Total	3,023	2,909	2,605	2,168	2,017	2,203	2,328	2,539	2,724	2,731	2,893	3,076	3,401	3,879	4,367	4,852	5,147	6,165	6,866	7,482	7,873	8,454

*Net payments are premiums minus claims paid.
Source: 1951 National Income Supplement to Survey of Current Business, U. S. Department of Commerce.

Table 2 • Per capita expenditures for dental care, 1929-1950, and a measure of the relative amount of dental service per capita, 1935-1950

Year	Estimated civilian population, July 1*	Expenditures for dental care ($ million)†	(A) Per capita expenditures for dental care	(B) Dental care price index‡	Relative amount of dental service per capita: (A) ÷ (B)/100
1950	150,208,000	991	$6.60	154.3	$4.28
1949	147,512,000	931	6.31	150.6	4.19
1948	145,171,000	895	6.17	144.8	4.26
1947	142,595,000	837	5.87	137.4	4.27
1946	138,394,000	821	5.93	126.9	4.67
1945	127,571,000	648	5.08	119.7	4.24
1944	126,606,000	643	5.08	114.8	4.43
1943	127,415,000	606	4.76	108.8	4.38
1942	130,854,000	545	4.16	104.1	4.00
1941	131,556,000	468	3.56	101.5	3.51
1940	131,642,000	419	3.18	101.1	3.15
1939	130,880,000	386	2.95	101.1	2.92
1938	129,825,000	356	2.74	101.0	2.71
1937	128,825,000	350	2.72	100.9	2.70
1936	128,053,000	331	2.58	98.6	2.62
1935	127,250,000	302	2.37	98.4	2.41
1934	126,374,000	295	2.33	....	...
1933	125,579,000	276	2.20	....	...
1932	124,840,000	312	2.50	....	...
1931	124,040,000	408	3.29	....	...
1930	123,077,000	463	3.76	....	...
1929	121,770,000	482	3.96	....	...

*Population for 1950 was taken from Current Population Reports, Bureau of the Census, Series P-25, No. 51, June 21, 1951. Populations for 1940-1949 were taken from Current Population Reports, Series P-25, No. 48, Bureau of the Census, March 22, 1951. Populations for 1929-1939 were taken from Statistical Abstract of the United States, 1949; they include members of the Armed Forces stationed in the United States.

†Source of dental expenditure figures was the 1951 National Income Supplement to Survey of Current Business, published by the U. S. Department of Commerce.

‡Source of dental care price index was Bureau of Labor Statistics, U. S. Department of Labor (several publications).

to 1935, because dental price indexes are not available.

Expenditures for dental care, as a percentage of all health expenditures, have fluctuated as shown in Figure 2. While payments to dentists have increased sharply, total health expenditures have shown an even greater rise. Dental expenditures were 2.75 times as high in 1950 as the average for 1929-1939, but all health expenditures together were 3.30 times as high.

It is interesting to compare dental expenditures with expenditures for items generally considered to be less essential.

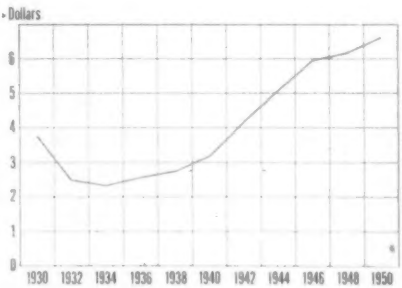
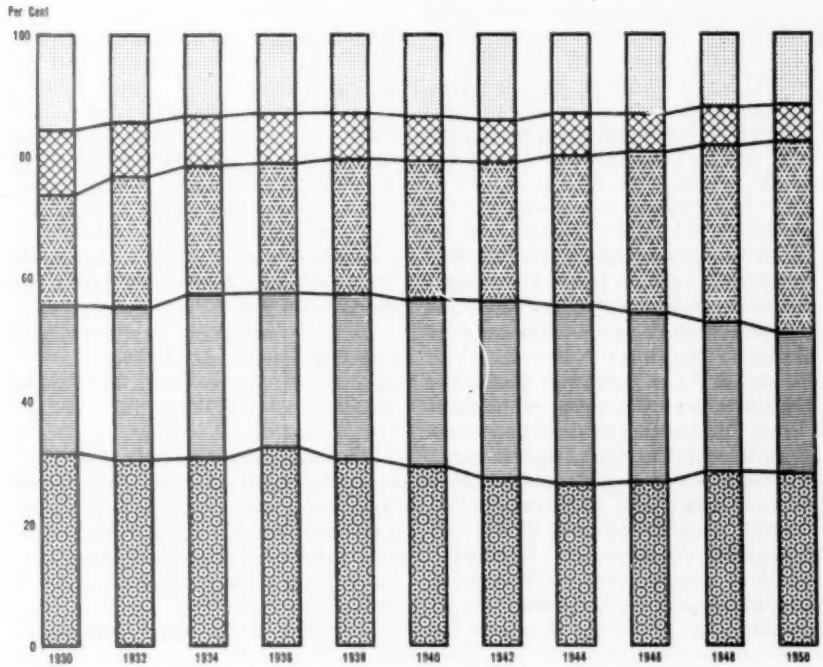


Fig. 1 • Per capita personal expenditures for dental care, 1930-1950. (Data from Table 2)



A. Dentists.

B. Osteopathic physicians, chiropractors, podiatrists, private duty trained nurses, practical nurses, midwives, miscellaneous curative and healing professions.

C. Privately controlled hospitals and sanitariums, net payments to group hospitalization and health associations, student fees for medical care, accident and health insurance—net payments, mutual accident and sick benefit associations—net payments.

D. Drug preparations and sundries, ophthalmic products and orthopedic appliances.

E. Physicians.

Fig. 2 • Percentage distribution of personal expenditures for health care, 1930-1950. (Data from Table 1)

For instance, in 1950 the American people spent over eight times as much for alcoholic beverages as for dental care, and about four and one half times as much for tobacco and smoking supplies. "Admissions to spectator amusements" amounted to almost twice the dental bill, and the total recreation bill was more than 11 times the dental bill. During the 10 year period ending 1950, the American people spent $71,955,000,000 for alcoholic beverages and $7,385,000,000 for dental care.

B. Duane Moen, Director

COUNCIL ON LEGISLATION

Pending Federal legislation of interest to dentists

When the second session of the 82nd Congress convenes in January, the Council on Legislation will be faced with a full program of pending legislation of interest to dentistry.

First on the program will be another attempt to secure enactment of the Army Dental Bill. For this purpose cooperation of all constituent societies and all members who served in the Armed Forces during World War II will be sought.

There has been an Army Dental Bill, sponsored by the Association, before each session of Congress since 1945. To date, these bills have been enacted on two occasions by the Senate but they have not advanced beyond committee consideration stage in the House of Representatives.

Just prior to the adjournment of Congress Senator Lester C. Hunt (D., Wyo.) again persuaded the Senate to pass one version of the Army Dental Bill under the number S 781. This bill is now before the House of Representatives' Armed Services Committee together with HR 344 sponsored by Representative L. Mendel Rivers (D., S.C.) and HR 164 introduced by Representative Walter Brehm (R., Ohio). Congressman Rivers has promised an early hearing on the bill.

There are certain technical differences between S 781 and HR 344 and the Council will seek to have the former amended to carry the text of the latter. If this can be accomplished the Association's objective will be obtained and it will only be necessary for the Senate to concur in the House action, an easier matter to accomplish than to obtain passage by the Senate of another bill on the same subject.

The bill which the Association will push relates to the Army alone. It would not apply to the Air Force. Its principal provisions are as follows:

(1) Designates the Chief Dental Officer of the Army as "Chief of the Dental Corps" and makes him responsible for making recommendations to the Secretary of the Army and the Surgeon General on all matters relating to dental health.

(2) Changes the name of the Army Medical Service to "Army Health Service." The purpose of this is to indicate that the Surgeon General's department is concerned with over-all health and that medicine is but one of its divisions.

(3) Establishes the ratio of dental officers to active duty personnel at "approximately two per thousand."

(4) Requires the Secretary of the Army to provide for the training of an adequate number of enlisted personnel in fields ancillary to dentistry and the assignment of such personnel "in effective numbers" to duty with dental officers.

(5) Instructs the Secretary of the Army "to require the Chief of the Dental Corps" to establish professional standards and policies, to conduct inspections and surveys and to initiate and recommend personnel actions and to serve as the adviser to the Army Health Service on all matters relating directly to dentistry.

(6) Requires the Secretary of the Army to provide for the organization of the Dental Service so that the Senior Dental Officer in each "major command, Army Division, headquarters or other installation shall be directly responsible to the commanding general or officer for all professional, technical and administrative matters pertaining to the dental health of the command, including but not limited to, the assignment or detailing of dental officers and assigned auxiliary personnel with the command, division, headquarters or installation."

Other items of interest to dentistry still pending on the Congressional calendars include bills relating to local public health units, school health services, aid to health education; establishment of National Children's Dental Health Day, Universal Military Training recommendations, Compulsory Health Insurance, various departmental reorganization measures which might change the structure of dental service in the Federal government; the Coudert and Ives proposals with regard to the postponement of income tax on portions of the incomes of professional men, an appropriation to construct the building for the National Institute of Dental Research and several other matters which are not particularly active.

The Council is ably assisted in its work by two auxiliary groups, the State Advisory Service and the Congressional Liaison Service. The first consists of the chairmen of state legislative committees, the second of volunteer dentists who assist in the presentation of the Association's views with regard to pending legislation to the members of Congress. The Council also would like to acknowledge the consistent cooperation of the state secretaries and executive secretaries. It is the backing and constant support of these groups which makes possible whatever success the Council may have in carrying out the legislative program of the Association.

E. Harold Gale
Chairman

COUNCIL ON DENTAL RESEARCH

Product added to A.D.A. List of Certified Dental Materials

Since the publication of the most recently revised List of Certified Dental Materials (J.A.DA. 43:78, July 1951; 43:495, Oct. 1951) the following material which conforms to A.D.A. Specification No. 1 has been added:

CERTIFIED AMALGAM ALLOYS (A.D.A. SPECIFICATION NO. 1)

Alloy	*Manufacturer or Distributor*
Brewster Medium Alloy	Brewster Laboratories

BUREAU OF LIBRARY AND INDEXING SERVICE

Dental motion pictures, slides and film strips

For some time the American Dental Association has owned and circulated a collection of motion picture films, slides and film strips on dental health and dental technical subjects. The use made of this material by the constituent and component societies and other interested groups indicated that the value of this service could be increased by the addition of more of this type of audio-visual materials, particularly of a technical nature. Accordingly the Board of Trustees and House of Delegates at .the Washington meeting approved the budget for this increased service and placed it, for administrative reasons, in the Bureau of Library and Indexing Service of the Association. This change becomes effective January 1952. The staff of the Bureau is aware of the responsibility to the members of the Association that will be involved in assembling and maintaining a valuable collection of films and slides for professional use and for the education of the public.

The development of the film library will take time. At present the motion picture collection is limited almost entirely to dental health films. At least six months will be needed to build up a representative collection of technical dental motion picture films and slides and to prepare adequate descriptive lists. Beginning with January 112 copies of 29 film titles will be available. There are about 160 more technical dental films that should be considered for inclusion. The previewing of this number of films alone will take considerable time. Several of the newer films have already been received as gifts. Such generosity is appreciated. Gifts of older films will be welcomed also, since there are undoubtedly a number that should be preserved because of their historical interest and value.

Films and other materials will be available on loan to dental societies, dental schools, and other interested health groups as well as to lay groups upon proper sponsorship. Because films and other visual education material must be examined for breaks and other damage after each showing, it will be necessary to charge a small rental fee for the use of the material.

It is important that the Bureau gather as complete information as possible concerning the location and availability of technical dental films, dental health films, films in related fields of special interest to dentists, slides, and film strips. This information is being solicited. For if it is not possible for the Bureau to procure copies of material for its collection, the next best service that it can offer is to be able to direct inquirers to the source of the material.

Donald A. Washburn, Director

Provisions of income tax law of interest to dentists

J. P. Revenaugh and A. T. Frank, Chicago

The following article is presented primarily to acquaint members of the dental profession with the general provisions of the current income tax law. Although the authors have anticipated most of the more common questions that will confront the dentist in preparing his income tax report, the replies, necessarily, are couched in general terms. Dentists who are faced with specific tax problems are advised to consult their attorney or income tax adviser.—*Editor*

In general there is little change between the 1951 and 1952 income tax law with the exception of a slight change in rates of taxation and a few miscellaneous provisions. The new tax law provides that for 1952 and 1953 the increased tax rates will prevail, but it further provides for a sharp decrease in income tax in 1954.

Exemptions • If the taxpayer is 65, he may claim two exemptions instead of one. If he is blind he may claim an additional exemption. Each exemption is $600. If the taxpayer's wife is named jointly on the return and she is 65, two exemptions may be claimed for her. If she is blind, three exemptions may be taken for her.

Dependents • A dependent may be claimed if major support has been given by either the husband or wife filing the return and if the dependent is related to either by blood lines (not extending to cousins), or through the blood lines of the spouse (not extending to cousins). For example, the grandchild of the taxpayer's wife may be a dependent, even though he is the taxpayer's step grandchild. An uncle may be a dependent but a cousin may not. A person legally adopted may be a dependent, but a ward may not be a dependent. The age of the dependent is unimportant. A son or daughter in college, even though over 21, may be a dependent as long as the taxpayer contributed the major support. The dependent may file an income tax return of his own and still be a dependent if he does not report an income of $600 or more. This differs from the previous law because $500 was the former limit.

Salaries • If the dentist is conducting a private practice and also is receiving a salary from a business firm or a school or any other source where tax is withheld from the pay check, the gross salary must be entered on the tax return and the amount of tax which has been with-

Business consultants to the dental and medical professions.

held listed, although segregated from the receipts from practice.

Salaries must be reported by all employers. If a dentist fails to segregate such a salary from his practice receipts, the Department of Internal Revenue will be forced to inspect the return.

Income from Practice • The full amount of income which has been received from the practice of dentistry must be reported. The sums which may have been paid to another dentist who has substituted for the taxpayer, or who is associated with him in practice, cannot be subtracted. The sums paid to an associate or a substitute should be listed as an expense.

Expenses • All expenses necessary to the conduct of a practice are deductible, but they must be both "necessary and reasonable."

The only items a dentist may be doubtful about are entertainment expenses. Certain entertainment expenses are deductible by the dentist as they are by any other business man. Entertainment must meet the test of who was entertained, when, and the cost, together with a further test that the entertainment was customary and necessary.

There has been considerable argument on this point and many professional men have attempted to include costs of entertainment which are not justified. It is not necessary to prove that the entertainment brought direct results in the amount of practice obtained any more than it is necessary for a business man to prove that advertising produced a direct dollar result. A specialist probably will have more occasion to entertain than a general practitioner.

Automobile Expense • The cost of driving a car to and from the home and office is not a deductible expense. If the car is used for calling on patients at their homes or in hospitals or in attending a practice in more than one location, the costs are deductible in proportion to the usage involved.

Convention and School Expenses • Convention expenses are deductible including transportation and the costs of housing and meals when the taxpayer is out of his home county. The costs of a wife accompanying her husband are not deductible. There are exceptions to this rule but they do not apply to the average dentist. The same principle applies to attendance at clinics or other professional group meetings.

The cost of going to school is not deductible for a dentist. This is a broad statement which may be qualified by certain conditions which do not apply to the average practitioner; therefore, these details are omitted here.

Office in Home • Some tax consultants have recommended charging some home costs as business expense. Unless an operating unit and other facilities are maintained in the home, and unless the dentist sees a reasonable number of patients therein, he may not deduct any cost of the home as a business expense.

Depreciation • Interior construction costs of an office are customarily charged off over the period of the formal lease. Furniture, fixtures and equipment generally can be depreciated over a 10 year term. There are tables of depreciation periods for this type of equipment. As a rule, dental equipment can be fully depreciated in 10 years and the Department of Internal Revenue has usually accepted this basis in the past.

Capital Gains and Losses • The treatment of capital gains and losses is the same as in previous years, with the exception of the sale of a home. If a home has been sold at a profit during the year 1951 and if another home has been purchased or is under construction and contract within a year of the sale date, a capital gain on the residence sold need not be declared

unless the cost of the new home purchased or contracted for is less than the price received for the one sold.

If more money has been received for the house sold than was paid for the house bought, then the profit realized on the house sold must be considered.

For example, a home was purchased in 1940 for $10,000. It was sold in 1951 for $25,000. Another home was purchased in 1951 for $20,000. A home and $5,000 have been received. The $5,000 is a capital gain and must be so declared. If the cost of the old home was $10,000 and $3,000 has been spent on improvements since acquiring it, the adjusted cost was $13,000. A net gain of $12,000 has been realized on the sale of the old house. A tax has been paid in 1951 on $5,000, therefore the cost basis of the new property in case it is sold in the future would be $13,000.

The loss incurred in selling a residence may not be deducted unless that residence has been rented to a tenant and has been income producing property.

Itemized or Standard Deductions • The new rule is that if the taxpayer elects to take the standard 10 per cent deduction (maximum $1,000) in lieu of detailing interest paid, taxes paid and other itemized deductions, it is still possible to change one's mind at any time after the tax return has been filed and not be bound by the original decision. This differs from the prior law.

If the taxpayer chooses to itemize his deductions rather than to take the standard 10 per cent deduction, then the following rules must be observed.

Contributions • All sums paid by the taxpayer to an approved charitable, religious or educational organization are deductible. The aggregate sum may not exceed 15 per cent of taxable income. Sums contributed to influence legislation, or to individuals or unorganized charities are not deductible. If the church bazaar is part of the church organization, contributions to it are deductible. If the bazaar is conducted by an informal group of church women who may dispose of the proceeds for any purpose they select, the contribution is not deductible.

A book is published by the Department of Internal Revenue listing approved organizations. The book is necessarily limited in its listings, but it forms a guide which may be helpful.

Interest Paid • All sums paid as interest during the year are deductible. A house mortgage payment always contains some interest payment. Accrued interest or those sums which have been charged but which have not been paid are not deductible because income is reported on a cash basis.

Taxes • The local newspapers give a list of the taxes which are deductible. In general, payments made for improvements, such as assessments for streets or sewers, may not be deducted even though they may be thought of as taxes.

Medical Expense • Here there is a change. The previous rule still applies that all expenses necessary to the diagnosis, treatment or conservation of health including premiums on a hospital or medical expense policy, which are in excess of 5 per cent of taxable income, may be deducted, provided not more than $1,250 per person listed on the tax return as husband and wife and dependents has been deducted. The maximum amount deductible for medical expense, under any conditions, is $5,000.

In the case of the taxpayer or spouse who is over 65, the entire amount paid is deductible, subject to the same maximum limitations. The 5 per cent is waived in such instances.

Other Deductions • Casualty losses which are not reimbursed by insurance and

which are not the result of negligence, are deductible. In this category come thefts of property which have been reported to the proper authorities or damage sustained by acts of God, such as wind storms. No loss from flood will be admitted if the taxpayer has a home on the edge of a creek which overflows its banks annually and floods his property.

In conclusion, caution should be observed in the keeping of all records. A taxpayer should not depend on memory or on a plea of ignorance of the law. It will get him nowhere. It is the duty of the taxpayer to sustain beyond a reasonable doubt all records of income and of expense. Failure to keep such records can imply an attempt at fraud on the taxpayer's part, or at least can result in a penalty for negligence.

Excuses are no longer accepted. The rules of record keeping are being more strictly applied every day. If a proper system has not been installed, then the dentist should install one.

59 East Madison Street

Vitamins and Minerals • Human nature being what it is, there will always be some outlaws—people whose object is to prey on their fellow men. Today a new group of these parasites seems to be developing. Perhaps they have a vitamin-mineral mixture to promote; perhaps a pseudo-scientific book or "course in nutrition."

Vitamin-mineral mixtures have their place. They are, in fact, recognized under the special dietary food section of the Food, Drug, and Cosmetic Act. If labeled honestly, as required by the regulation, their distribution is not contrary to public interest. But where their sale is promoted by representations, through various and sundry means, that our food supply is debased and adulterated and that our only salvation is to rely on peculiar and sometimes unpalatable mixtures, a vicious imposition on the public occurs.

As far back as any of us can remember we have had nutritional zealots among us, some sincere, some with something to sell, many of them crackpots. They all acquire a following. In contrast to the cranks and nostrum vendors we had competent nutritionists who clearly perceived that there were nutritional areas that needed attention; and so there developed some nutritional advances like the incorporation of vitamin D in milk and the enrichment of flour and other cereal products with vitamins and minerals. In passing let me point out that these are in truth chemical additives to food, and yet the addition of these chemical additives was definitely in the public interest. *Drug and Cosmetic Industry 69:456, October, 1951.*

JANUARY 1952

LON W. MORREY, D.D.S., EDITOR
VOLUME 44 • NUMBER 1

Published by the American Dental Association
222 East Superior Street • Chicago 11, Illinois

THE Journal OF THE AMERICAN DENTAL ASSOCIATION

Editorials

Streamlining of dental education unjustified

Speaking at the twenty-seventh annual Greater New York Dental Meeting last month, LeRoy M. Ennis, president of the Association, took issue with the methods suggested by the Health Resources Advisory Committee of the Office of Defense Mobilization[1] to increase dental manpower. The Committee implies that World War II emergency educational procedures should be revived, that the four year dental training period be streamlined to three and that dental schools increase their enrollment by 15 per cent.

Criticizing the pressure emanating from Washington, D. C., to accelerate dental education, Dr. Ennis pointed out that the recommendation of the Health Resources Advisory Committee is totally unrealistic since 85 per cent of the nation's 42 dental schools now have fewer than 25 full-time faculty members each, and more than 125 full-time faculty positions are vacant, which dental deans are unable to fill. He stressed the fact that before trying to turn out more graduates by streamlining training and overcrowding classes, the profession should make certain that the dental schools have adequate teaching staffs and facilities to handle greater numbers of students.

Dr. Ennis' observations are plain common sense. No permanent superstructure can be built on a weak foundation. The unforgettable and unfortunate experience of the profession during World War II proved that scientific education, unlike water, cannot be turned off and on at will.

Granted that during the 15 year period prior to 1945 the nation experienced a dearth of dental graduates. That condition no longer exists. Despite the limitations imposed by understaffed faculties America's 42 dental schools now graduate approximately 2,800 students per year, an increase of about 1,100 or 33⅓ per cent over the annual number of students graduated during the 1930's and first half of the

1940's. During that low ebb period the dental schools graduated about 1,700 students annually, scarcely sufficient to compensate for the number of dentists lost through death and retirement. During the past three years the spread between the gain and loss of dental manpower has gradually widened. According to the obituary reports of the Association, the profession lost approximately 1,500 dentists through death during 1951, of whom some 900 were actively engaged in practice and 600 were on the retired list. In addition to the 900 about 850, it is estimated, were lost through retirement or change in occupation; a total loss of approximately 1,750 active dentists. Thus the profession made a net gain of 1,050 members last year. Under present economic and educational conditions dentistry should continue to gain at least 1,100 members annually in the immediate future. When the several new dental schools, now blueprinted, materialize, the annual output of dental manpower will be increased further.

In view of the steady, healthy growth in dental manpower that has taken place during the past several years and the expansion of educational facilities assured for the immediate future the profession can ill afford to be precipitated into the scramble for high-pressure mass education.

1. Schoeny, Leo J. Dentistry, mobilization and manpower. J.A.D.A. 42:548 (May) 1951.

America receives more dentistry at less relative cost

The American people paid a billion dollars for dental care in 1950,[1] more than three times the amount paid for dental services in 1935. Two of the reasons for this great increase were a population growth of 23 million (18 per cent) and an increase in the price of dental care amounting to 56.8 per cent. The predominant reason was an increase of 77.6 per cent in the amount of dental service being received per capita.

An analysis of the U. S. Department of Commerce estimates of consumer expenditures, presented on page 76 by the Bureau of Economic Research and Statistics, shows that the dental profession not only has been able to keep up with the growth in population, but in 15 years actually has almost doubled the amount of dental care being provided per capita. It seems a reasonable assumption that this increase resulted more from a wider distribution of dental services than from an increase in the amount received by each patient.

Although the dental care per capita is almost twice as much as in 1935, the American people are actually spending a smaller proportion of their budget for the service. The Department of Commerce statistics indicate that payments to dentists in 1935 amounted to 0.54 per cent of all consumer expenditures, against 0.51 per cent in 1950. The price index for dental care computed by the U. S. Department of Labor has shown consistently that the price of dental care has risen only 56.8 per cent—far less than per capita income and less than the general cost of living, which increased 75.2 per cent between 1935 and 1950.

1. U. S. Department of Commerce. 1951 national income supplement to survey of current business. Washington, D. C., Government Printing Office, 1951.

Relief Fund campaign drags: help spark it by contributing

The Council on Relief of the Association reports that as of December 15, 1951, contributions amounting to $58,764.96 have been received from the current sale of Relief Fund Seals. This is not an encouraging report as the returns to date fall far short of the $100,000 goal estimated by the Council for this year's Relief Seal drive and much less than is required by the Association and the constituent societies to provide impoverished members of the profession with the bare necessities of life. Indeed, the $100,000 goal itself is insufficient for the purpose.

As has been pointed out previously in discussing this worthy, altruistic program—the only one of its kind conducted by a national professional organization—at least $250,000 is needed annually to finance the project adequately. Nor is $250,000 an impossible sum. Sixty-five thousand members of the Association could easily raise that amount, and more, by simply enclosing a five dollar bill or a five dollar check in an envelope and mailing it to the Council on Relief, American Dental Association, 222 East Superior Street, Chicago.

Such a gesture would be simple and painless and cause little or no inconvenience to anyone. Remember that in these days of inflation dentists inactivated by illness, like those in active practice, are caught in the whirl of spiraling prices. Dentists in practice still have some opportunity to adjust their incomes, those on relief do not.

If, in these ultramodern times, it is still permissible to make New Year's resolutions, every dentist should resolve to aid the Council on Relief to reach this year's $100,000 goal—and to raise that goal in the future.

Washington News Letter

Coincident with the new year, senators and representatives are re-assembling in Washington for the second session of the 82nd Congress. There is much unfinished business, and circumstances of global strife, domestic problems and political campaigning for '52 give assurance of much new business. Apart from the supremely important business of bringing the war in Korea to a successful conclusion and strengthening the nation's ramparts of defense, Congress will consider several issues of particular importance to the dental profession.

National Health Insurance • The matter of Federal health insurance will be around again in 1952. It is inconceivable that its mere handful of supporters on Capitol Hill will make any real progress in advancing this type of legislation. But the spectre of NHI will hover over the Senate and House chambers—and in committee rooms and lobbies as well—whenever health or hospital legislation may be under consideration. Already the subject has achieved prominence in connection with political maneuverings for the Republican presidential nomination, and undoubtedly, in the months to come, NHI will continue its fierce bark, even though it may not bite.

Service in the Military • Military service by dentists necessitates legislation on procedures to be followed in drafting dentists; optimal use of their services after they come into uniform, voluntarily or involuntarily; ample recognition, by the Armed Forces themselves, of the need for developing and maintaining a high level of autonomy and professional solidarity within their respective dental departments. During the past year, these problems and related ones have been studied diligently in the Pentagon, at Selective Service headquarters and in advisory counsels of Office of Defense Mobilization. Further explorations are indicated, however, before the time is ripe for any legislative proposals. In this regard, an unprecedented joint meeting of the Armed Forces Medical Policy Council and the Health Resources Advisory Committee was held in mid-December chiefly to discuss and correct numerous inequities that have grown up since the mobilization program started. It is highly probable that reforms will result, some to be effected by regulation and others requiring Congressional action.

Support of Dental Education • The support of medical, dental and nursing education constitutes one of the most controversial issues on the 1952 calendar in Congress. The primary question is whether the Federal Treasury should give financial aid to professional schools and set up Government scholarships as a means of increasing the supply of practitioners. The Department of Defense considers creating its own medical and dental scholarships for the purpose of insuring a steady, if small, increment of officers in the Regular Medical and Dental Corps. In the event of all out mobilization, prospects of the military scholarship plan probably would be enhanced but financial aid to schools would be rejected because of its far greater cost.

Health Care of Veterans • Here is one of the most volatile subjects that Congress will have to deal with this year. Focal point is the question of Federal responsibility in disability cases not connected with service. Although service-connected cases only are eligible for outpatient medical and dental care, the other kind predominate by a 2-1 margin in hospital services rendered. During the current fiscal year, Uncle Sam will spend nearly $40 million on veterans' outpatient dental care alone, exclusive of the cost of furnishing similar services to in-patients. Ironically, many of the most articulate opponents of socialized medicine endorse a *laissez faire* policy where the far flung and politically potent Veterans Administration is concerned, at the same time conceding that its multi-billion-dollar health care program embraces the essence of socialized medicine.

National Institute of Dental Research • It will be up to Congress to determine whether the National Institute of Dental Research is to get the funds required for construction of its own building; whether grants-in-aid for support of non-Federal dental research and fluoridation of communal water supplies will be continued; whether a system of government hospital insurance is to be instituted for coverage of citizens in the 65-and-over group.

A single factor is common to all of these questions—Federal control, whether it is for better or for worse. One of the country's leading scholars and science administrators, Vannevar Bush, confessed he is beset by doubts and misgivings when he said in his annual

report as president of Carnegie Institution of Washington on December 14:

"Centralized Federal control of research has inherent potentialities that are very dangerous, and bureaucratic control could in time become onerous indeed. Dependence on variable and uncertain yearly governmental appropriations increases the dangers of control, tends to emphasize the ephemeral, could blight the whole growth, and could put our universities into very serious financial and organizational difficulties."

The new session of Congress will last at least until July and perhaps considerably longer, depending on the international situation, even though its members will desire an early adjournment so they might participate in political campaigning at home. Come what may, the dental profession may safely anticipate some highly interesting developments along the left bank of the Potomac in the months lying ahead.

International Correspondence

NEWS FROM GREAT BRITAIN

The death on November 13 of E. B. Dowsett, president of the British Dental Association, is mourned throughout the country. His health had been indifferent for some time but he seemed to have recovered considerably when he took office in July. Dentistry has much to be proud of in the memory of this man.

The office of President will remain unfilled until the Representative Board elects his successor at its January meeting.

DENTISTS BILL

On November 27, Lord Woolton presented to the House of Lords a bill to amend the Dentists Acts which was in preparation by the Labour Government during the previous year. Probably it will not be debated before March; in the meantime it lies available for study and for amendment by members of the House.

Such an amending act as the bill foreshadows is necessary; it is the obvious sequel to the acceptance by the Labour Government of the report of the Interdepartmental Committee on Dentistry (the Teviot Committee), a recommendation of which was that the present method of governing the dentists be changed. At present the General Medical Council is the governing group, acting through the medium of the Dental Board of the United Kingdom. The Dental Board makes recommendations and the G.M.C. takes the necessary action.

The new bill proposes replacement of the Dental Board by a General Dental Council which would closely resemble the General Medical Council in composition and function. If the new G.D.C. is formed, the dental profession will be self-governed and independent of the medical profession. The bill proposes that the Council should consist of 34 members; one representative from each of the 18 universities and colleges which grant degrees and diplomas in dental surgery, nine representatives of registered dental practitioners to be elected by the dentists, and seven representatives of the State and the General Medical Council. The G.D.C. will be responsible for dental education, the keeping of the Dentists Register, and the admission of Commonwealth and foreign dentists to the Dentists Register, and it will exert a disciplinary control over the dentists.

The second important feature of the bill is the responsibility it seeks to place upon the Council, once the latter is established, to make arrangements for an experimental scheme to test the value of dental ancillary workers qualified to extract or conserve teeth. Such ancillary workers would be under the supervision of a qualified dentist and would work only in hospitals or public dental clinics. At the end of three years a report is to be submitted to the Privy Council and in the light of the report the Dental Council is to be instructed either to proceed with the experiment or to terminate it. The regulations for the establishment of this group of ancillary workers are to be made by the Dental Council. It is also likely that the G.D.C. will have the task of naming

these workers, for so far there is no indication that the term "dental nurse" has been accepted. Once the regulations have been drawn up they will require approval from the Privy Council and both Houses of Parliament.

Another recommendation in the new bill is that the term "Dental Surgeon" will no longer be reserved for the academically qualified practitioner; the title will be legitimate to all who are enrolled on the Dentists Register. Other provisions of the bill include one to legalize the position of dental students treating patients in dental hospitals during their period of training, one to simplify the methods of admission of Commonwealth and foreign dentists to the Dentists Register, and one to prevent lay people from carrying on a dental business by employing dentists to treat patients.

In dental circles the main discussion is likely to center mainly on the ancillary worker, and the cry of "No Dilution" will be heard. No one can view the proposal with equanimity and there are many convinced that the introduction of practically rather than academically trained personnel would affect the quality and quantity of the entrants to the dental school for full training.

With regard to the School Dental Service, which this provision is largely designed to help, the present situation has recently been stated by the Minister of Education. Florence Horsbrugh said that for a complete service of dental inspection and treatment of school children, a ratio of at least one dentist to 3,000 children would be required. To achieve this, an additional 1,150 full-time dentists would have to be employed. In England and Wales, 200 full-time dentists would be required to get the School Dental Service back to the level of 1948 before the time of the health service. Miss Horsbrugh said she intended to review the problem of the School Dental Service.

The question now being considered by dentists is whether ancillary workers will solve the problem. The British Dental Association will be able to express an opinion on this provision of the bill, but on the provision which enables those with no academic qualification to use the title "dental surgeon," it will be silent. A number of practitioners will see no reason to introduce this alteration in accepted custom which has legal sanction. However, the majority will not wish the present happy unification of the profession to be marred by an issue which will disappear with the passing of time.

WEBB JOHNSON LECTURE

The *Treponema pallidum* has been clearly demonstrated in the tissues of a tooth germ from a child with inherited syphilis. A coloured photograph of this section projected upon the screen was the climax of the first Webb Johnson lectures, and terminated a long sustained controversy as to whether spirochetes were present in the tooth germ. Professor R. V. Bradlaw delivered the inaugural lecture.

John Boyes

NEWS FROM NORWAY

A committee appointed by the Ministry of Education to plan the curriculum of the future has now accomplished its task. The committee proposes a program of four years' study, with a graduate course of one year which should be voluntary.

Because of the acute scarcity of qualified dentists in Norway, especially in school dentistry and in the public health service, there arose during the committee's work a discussion of the possibility of employing dental nurses especially trained in operative dentistry in the services mentioned.

The Board of Trustees of the Norwegian Dental Association has taken a firm stand against licensing persons other than qualified dentists to operate on teeth and their surrounding tissues. It maintains that the school dental program in Norway, which at present benefits 80 per cent of the school children, stands high in public opinion, and that to consign this service to unqualified personnel would constitute a serious retrogression. The Board proposes the education and training of dental assistants and hygiensts to assist the dentists along the lines approved by the American Dental Association, thus aiding the effectiveness of qualified personnel.

The Norwegian Institute of Dental Research is now in full activity. Clinical experimental work in caries research is under way, and cooperation with one of the biggest factories in the capital has been established. It is hoped that magnificent statistical data on periodontal diseases will be obtained as a result of clinical and roentgenological examination of all employees of this factory. Local treatment and instruction in dental hygiene also will be given to the employees.

The research staff at the Institute is comprised of B. Nygaard Östby, director; T. Mörch, who is engaged in caries research; J. Wærhaug, whose special field of interest is periodontology, and H. Sand.

B. Nygaard Östby, director, Norwegian Institute of Dental Research

Knut Gard, secretary-general, Norwegian Dental Society

Association Affairs

AID OF MEMBERS SOUGHT IN PLANNING ANNUAL SESSION

Names of Association members with outstanding scientific material to contribute to the ninety-third annual session of the Association are being sought by William A. Garrett of Atlanta, secretary of the Council on Scientific Session. Dr. Garrett has requested that suggestions regarding essayists, table clinicians and motion picture and scientific exhibitors be sent as soon as possible to L. M. Cruttenden, assistant secretary of the American Dental Association, 222 East Superior Street, Chicago 11.

LIFE MEMBER APPLICATIONS MUST BE IN BY JULY 8

July 8 is 1952 deadline for receipt of applications for life membership for presentation to the House of Delegates of the Association, according to Harold Hillenbrand, secretary. The date was set in conformance with the recent ruling of the Board of Trustees which stated that no applications for life membership would be considered if received later than 60 days in advance of the annual session. The annual session is to be held September 8-11 in St. Louis.

ASSOCIATION POLICY STATED AT HEALTH UNITS MEETING

The policy of the Association regarding public health units was presented at the fourth annual meeting of the National Health Council's National Advisory Committee on Local Health Units on December 6 by W. Philip Phair, assistant secretary of the Council on Dental Health. The House of Delegates, at its meeting last October, voted to support the development of public health units, and approved the policy of seeking grants-in-aid, where local funds are inadequate, "provided that the right of the state or community to adapt any program to its own needs is safeguarded."

An interesting fact revealed at the meeting is that 72 per cent of the population of the United States is covered by basic public health services, Dr. Phair reported. Because of a great shortage of health officers, there is a movement toward the appointment of nonmedical administrators, he said.

A kit containing material to aid in community health planning and an exhibit setting forth the advantages of health councils are available from the National Health Council, it was reported. Forty-two representatives of approximately 35 national health and welfare organizations attended the meeting, according to Dr. Phair.

COUNCIL ON LEGISLATION PLANS 1952 ACTIVITIES

The Council on Legislation of the Association met December 9-10 in the Central Office to review the instructions given to it by the House of Delegates last October, and to make plans for carrying them out.

Chief among its activities will be efforts to obtain an appropriation for construction of the National Institute of Dental Research building, in spite of a Presidential order banning unnecessary construction, according to E. Harold Gale of Albany, chairman.

Legislation affecting dentistry which will be the concern of the Council during 1952 includes the Army Dental Bill, a bill to provide Federal aid to dental education, and a bill designed to assist states in developing and maintaining local public health units organized to provide basic full-time public health services. More specific definition of certain provisions in the latter act is to be sought, Dr. Gale reported. The act has received no Congressional action but has been approved "in principle" by the House of Delegates of the Association.

The Council will seek legislation to amend the present law regarding the Veterans Administration Department of Medicine and Surgery so as to spell out the functions of the dental division, Dr. Gale said. The bill will be drafted in accordance with the principles previously employed for the Dental Corps of the armed services.

T. J. McDermott of Cleveland was appointed vice-chairman of the Council.

COUNCIL ON DENTAL RESEARCH PLANS EXPANSION OF DUTIES

The Council on Dental Research met on November 28 to make preliminary plans for performance of the expanded duties assigned to it by the House of Delegates.

Until a permanent secretary for the Council is obtained, J. Roy Doty will serve as acting secretary. Dr. Doty is secretary of the Council on Dental Therapeutics.

In another important step, the Council made preliminary plans for collection of information regarding various phases of dental research throughout the country. It is planned to employ this material to carry out the instructions in the revised Bylaw, which requires the Council to recommend to the Board of Trustees methods for improving such research, Dr. Doty has reported.

Discussion of the housing facilities for the National Institute of Dental Research resulted in a decision to request the Council on Legislation to renew its vigorous efforts toward securing a separate building for dental research at Bethesda, Md. Although the building has been authorized by Congress, no funds for its construction have been appropriated.

The duties of the Council were expanded as a result of the recommendations, made after several years' study, by the Special Committee to Survey the Association's Research Program. The Committee, having discharged its duties, was disbanded at the annual session in 1951. Chairman of the Committee was Obed H. Moen, trustee from the Ninth District.

LIBRARY BUREAU PLANS DENTAL NOMENCLATURE MEETING

Plans for a two-day conference on dental nomenclature, with "Concepts Pertaining to Occlusion" the main subject of discussion, have been announced by the Bureau of Library and Indexing Service of the Association.

The conference will be held at the Central Office and has been tentatively set for June 20-21. Inquiries should be addressed to Donald Washburn, director of the Bureau, at 222 East Superior Street, Chicago 11.

ENNIS NAMES ASSOCIATION'S DELEGATES TO F.D.I. COUNCIL

LeRoy M. Ennis, president of the Association, has appointed five delegates to represent the Association on the executive council of the Fédération Dentaire Internationale, which meets in London in July. They are: Daniel F. Lynch, trustee from the Fourth District; Obed H. Moen, trustee from the Ninth District; Oren A. Oliver, member of the Council on International Relations; Har-

old Hillenbrand, secretary of the Association; as well as Dr. Ennis. In addition the appointment of several honorary delegates is expected to be announced at a later date.

AD INTERIM APPOINTMENTS MADE TO JUDICIAL COUNCIL

Two *ad interim* appointments to the Judicial Council have been made by LeRoy M. Ennis, president of the Association.

Willard C. Fleming of San Francisco has been appointed to succeed Ernest G. Sloman, who resigned from the Council when he was elected speaker of the House of Delegates last October. D. W. Wilson of Belle Plaine, Minn., has been appointed to replace Myron E. Lusk of Minneapolis, deceased.

NEW PLAN REDUCES DIRECTORY SUPPLEMENT PRICE TO $15

The *Cumulative Supplement to the American Dental Directory* will be published semi-annually instead of quarterly in 1952, and the subscription price will be $15 instead of $25, John J. Hollister, business manager of the Association, has announced.

The new policy does not affect the present initial subscription fee of $37.50 for the service, which includes the 1,000 page *American Dental Directory* published in mid-1950 together with supplements which bring it up to date to the end of 1951.

VOL. 43 INDEX FOR JOURNAL IS AVAILABLE ON REQUEST

The index for volume 43 of THE JOURNAL, covering the issues for the last six months of 1951, is ready for distribution. Requests for copies should be addressed to the Order Department, American Dental Association, 222 East Superior Street, Chicago, 11.

RELIEF FUND DONATIONS TOTAL $59,000 ON DECEMBER 15

Contributions totaling $58,764.96 had been received in the 1951-52 Relief Fund Campaign as of December 15, representing over 50 per cent of the goal of $100,000.

Alaska dentists maintained their lead in per capita contributions, with 120 per cent of their quota donated as of November 15, and 150 per cent as of December 15. North Dakota and Alabama dentists also exceeded their quotas, with contributions of 135 per cent and 126 per cent respectively.

In a statement on December 15, Leo W. Kremer, chairman of the Council on Relief, reemphasized the need for exceeding this year's quota and urged all dentists to give as generously as possible.

All contributions should be mailed to the American Dental Association Relief Fund, 222 East Superior Street, Chicago 11.

CIVIL DEFENSE SUBCOMMITTEE MEMBERSHIP IS ANNOUNCED

The appointment of three members of the Association to the subcommittee on civil defense of the Special Committee on National Emergency Dental Service has been announced by Harold Hillenbrand, secretary. They are Lloyd Rogers of Detroit, John R. Abel of Beverly Hills, Calif., and David E. Hunn of Troy, N.Y.

ACCEPTED DENTAL REMEDIES 1952 EDITION IS AVAILABLE

The 1952 edition of *Accepted Dental Remedies* is ready for distribution. The

221-page volume constitutes an up-to-date handbook of therapeutic agents in the dental field, and contains reports concerning all the products placed in the accepted (A) classification by the Council on Dental Therapeutics, which prepared it. Evaluations of nearly 700 commercial dental products are included, as well as a description of the present procedure for classification of the products, a discussion of prescription writing, and information on drug standards.

Copies of the new edition may be purchased for $1.50 from the Order Department, American Dental Association, 222 E. Superior Street, Chicago 11.

Dental Societies

ATTENDANCE NEARLY 15,000 AT GREATER NEW YORK MEETING

A total of 14,518 dentists and guests attended the Greater New York Dental Meeting at the Hotel Statler, New York, December 3-7. The meeting is an annual event sponsored by the First and Second District Dental Societies of New York.

LeRoy M. Ennis, president of the Association, addressing the first general session, described current problems within the scope of the Association's activities. Problems stressed by Dr. Ennis included the lax enforcement of state laws which jeopardizes the dental health of the public, and the threat to the quality of dental education incurred by Federal pressure to accelerate training programs.

Although only a minority of dental laboratories and dental laboratory technicians are engaged in the illegal practice of dentistry, the damage being done to the health of the public by these lawbreakers is alarming, he said. Pointing out that the Association does not believe that the problem could be solved by enactment of new state laws, he said that "such new legislation could not possibly contribute to the control of illegal dental practice what strict enforcement of the existing dental practice acts could contribute."

Dr. Ennis criticized the growing pressure from certain Federal agencies to accelerate dental training and increase the enrollment of dental students, and warned that "it carries a grave threat to the quality of dental education" in the United States.

In addition to five outstanding afternoon and evening general sessions, the program included 10 topic discussions, 50 table clinics, 42 registered clinics, a motion picture program, a television program, a display of health and scientific exhibits which members in attendance described as "unusually fine," and a crowded hall of technical exhibits.

The meeting was prepared under the direction of Stanley G. Standard, chairman of the organization committee of the First and Second District Dental Societies of the State of New York.

CHICAGO MIDWINTER MEETING TO BE HELD FEBRUARY 3-6

The Chicago Dental Society will hold its eighty-seventh annual midwinter meeting February 3-6 at the Conrad Hilton Hotel (formerly the Stevens).

A program of essays, clinics, motion pictures, scientific exhibits and health and educational exhibits will be presented by a group of distinguished dentists, with "What's New in 1952" the theme of the meeting.

Details may be obtained by writing to Karl L. Richardson, executive secretary, Chicago Dental Society, 30 North Michigan Avenue, Chicago 2.

Dental Education

DENTAL SCHOOLS ANNOUNCE POSTGRADUATE COURSES

Illinois • An all-day postgraduate course on the treatment of periodontal disease will be offered by the University of Illinois dental school on February 7, in Chicago, following the annual midwinter meeting of the Chicago Dental Society.

Serving on the faculty will be Balint Orban of Colorado Springs, Colo., who will discuss gingivectomy; Edward L. Ball of Cincinnati, who will teach prophylaxis; Raymond F. Johnson of Minneapolis, who will discuss the home care aspects of treatment; and Arne G. Lauritzen of Seattle, who will discuss the role of occlusion in the treatment of periodontal disease.

Fee for the course is $25. Details may be obtained by writing to the Postgraduate Division, University of Illinois College of Dentistry, 808 S. Wood Street, Chicago 12.

Nebraska • The University of Nebraska has announced four postgraduate courses to be offered in June.

A course in pedodontics is scheduled for June 9-13; enrollment limit is 14 and fee is $50. A course in fixed partial denture prosthesis (fixed bridge) will be held June 16-20; enrollment limit is 8 and fee is $60. Operative dentistry, including silver amalgam and self curing acrylic restorations, is the subject of a course to be held June 16-17 with an enrollment limit of 8. Fee is $25. On June 23-25 a course in dental roentgenography (extension cone technic) will be held. Enrollment limit is 16 and fee is $25.

Further information or application blanks may be obtained by writing to Ralph L. Ireland, director of graduate and postgraduate dental education, College of Dentistry, University of Nebraska, Lincoln 8, Neb.

Oregon • The University of Oregon Dental School has announced its schedule of postgraduate courses for the first five months of 1952.

A 35-hour course in oral pathology and diagnosis will be held January 14-18 with John K. Young of San Francisco as instructor; fee is $50. A 35-hour course in partial dentures by C. N. Skinner of Whittier, Calif., is scheduled for January 21-25; fee is $75. A 12-hour course in dentistry for children will be offered January 28-29 with Hugo M. Kulstad of San Francisco as instructor; fee is $25.

On February 4-5, a 12-hour course in dental medicine by J. Donald Shriber of Los Angeles is scheduled; fee is $25. A 12-hour course in general anesthesia will be held February 11-12 with Frederick P. Haugen of Portland, Ore., as instructor; fee is $25. Oral surgery is the subject of a 35-hour course by David H. Grimm of San Francisco to be offered February 18-22; fee is $75.

John Kuratli of Portland, Ore., will conduct a 70-hour course in crown and bridge March 10-21; fee is $150. Wm. H. Gyllenberg of Longview, Washington, will conduct a 35-hour course in gold inlays scheduled for April 7-11; fee is $75. A 12-hour course in oral pathology and diagnosis by Joseph L. Bernier of Washington, D.C., will be offered April 16-17; fee is $25. A 35-hour course in long-cone roentgenographic technic will be conducted by H. Cline Fixott, Jr., of Portland, Ore., April 21-25; fee is $75. Periodontics is the subject of a 12-hour course to be offered April 28-29 by B. O. A. Thomas of Seattle; fee is $25.

Saul C. Robinson of Portland, Ore., will conduct a 70-hour course on full dentures May 5-16. Fee is $150. Bernard Z. Rabinowitch of Los Angeles will conduct a 12-hour course in pedodontics May 26-27; fee is $25.

Further details may be obtained by writing to Vinson M. Weber, head of the department of postgraduate education, University of Oregon Dental School, 809 Northeast Sixth Avenue, Portland 14, Ore.

Pennsylvania • The University of Pennsylvania dental school has announced a postgraduate course in "Mouth Rehabilitation, Including Internal Precision Attachment," to be held February 4-9 under the direction of Charles B. Sceia.

Designed for the general practitioner, the course will include practical experience in fixed bridgework, demonstrations in the planning and design of restorations, preparation of abutment teeth, impression methods and use of materials, laboratory technic in detail, and the cementing of the final restoration. Suggestions for building crown and bridge practice and for avoiding or overcoming negative patient-reaction also will be included.

Tuition fee is $150; enrollment is limited to 12. Further details may be obtained by writing to Lester W. Burket, director of postgraduate courses, the Thomas W. Evans Museum and Dental Institute, University of Pennsylvania, 4001 Spruce Street, Philadelphia 4.

Toronto • Five continuation courses are offered by the University of Toronto dental school in January, February and March, and applications are being received for a graduate course in orthodontics to begin in September.

A course in cephalometric technics is scheduled for January 28-30, under the direction of Robert E. Moyers. Enrollment is limited to 10; tuition is $50. A course in operative dentistry under the direction of P. G. Anderson will be offered February 18-22, with Louis G. Schultz of the University of Michigan dental school as guest clinician. Enrollment limit is 10; tuition is $75. Dental radiology is the subject of a course scheduled for February 25-March 1, under the direction of H. M. Worth and J. E. Moser and with LeRoy M. Ennis, president of the Association, as guest lecturer and clinician. Enrollment is limited to 12; tuition fee is $75.

The etiology and prevention of dental caries will be presented in a course to be held March 6-8 under the direction of G. Nikiforuk, with R. F. Sognnaes of the Harvard dental school as guest lecturer. Enrollment is limited to 6; tuition is $50. A course in endodontics on March 10-14 will be under the direction of C. C. Hare and will have Louis I. Grossman of the University of Pennsylvania dental school as guest clinician. Enrollment limit is 8; tuition is $75.

A 17-month graduate course in orthodontics is to begin on September 2, limited to 6 graduates of approved dental schools and leading to the degree of Master of Science (Dent.). Deadline for receipt of applications is March 1.

Inquiries concerning all courses should be addressed to The Dean, Faculty of Dentistry, University of Toronto, 230 College Street, Toronto, Ont., Canada.

Washington (St. Louis) • Graduate courses in dental pediatrics, prosthetics, oral surgery and orthodontics, and leading to the degree of Master of Science, have been announced by Washington University School of Dentistry, St. Louis.

Details may be obtained by writing to Leroy R. Boling, secretary of the faculty, Washington University School of Dentistry, 4559 Scott Avenue, St. Louis 10.

TWO FELLOWSHIPS AVAILABLE AT WASHINGTON U. (ST. LOUIS)

Two fellowships, one in anatomy and one in pathology, are available at Washington University School of Dentistry, St. Louis, according to Leroy R. Boling, secretary of the faculty. The fellowships will be awarded to qualified dental graduates who wish to pursue additional studies in these fields. Each carries an annual stipend of $2,400. Opportunity to qualify for a Master of Arts degree is provided, and the fellowships are renewable for a second year.

Details may be obtained by writing to Dr. Boling at Washington University School of Dentistry, 4559 Scott Avenue, St. Louis 10, Mo.

HARVARD OFFERS RESEARCH AND TEACHING FELLOWSHIPS

The Harvard School of Dental Medicine has announced that a limited number of research and teaching fellowships are available for 1952-53 "to young dental graduates and to others with equivalent training and kindred interests." They will be awarded on the basis of scholastic record and evidence of genuine interest in a career of teaching and research and dentistry.

Remuneration, which will vary with the accomplishments and family obligations of the fellow, will be not less than $3,000 for postdoctoral fellows and $1,200 for predoctoral fellows. Reappointments for one or two additional years may be made as progress and needs warrant, the announcement states.

Applications must be received by March 1. Further details and information blanks may be obtained by writing to Reidar F. Sognnaes, chairman, committee on fellowships, Harvard School of Dental Medicine, 188 Longwood Avenue, Boston 15.

LOUISVILLE OFFERS ORAL SURGERY INTERNSHIPS

The University of Louisville dental school has announced an internship and residency training program in oral surgery, beginning July 1, in the oral surgery department of the Louisville General Hospital.

The one-year internship will include training in oral surgery with in-patients, and exodontics and minor oral surgery with out-patients, as well as a four-month tour of duty in anesthesiology. Trainees are encouraged to enroll in the University for a review of the basic sciences.

The program has the approval of the Council on Dental Education and the department has the approval of the Council on Hospital Dental Service of the Association. It follows the recommendations of the American Board of Oral Surgery for the specialty, but is open for trainees who wish to go into teaching, research, or general practice, the announcement states.

Full maintenance and a liberal stipend are furnished. Further details may be obtained by writing to Raymond E. Myers, dean, University of Louisville School of Dentistry, 129 East Broadway, Louisville.

National Defense

CIVIL DEFENSE TRAINING MANUALS ARE AVAILABLE

Civil Defense training manuals are available from the State Civil Defense directors, for use by dental groups which are beginning training courses, according to Russell W. Bunting, dental consultant in the health and special weapons defense division of the Federal Civil Defense Administration. The manuals (AG-11-1, AG 8-1 and AG 14-1) were sent last month to each of the nation's dental schools, he reported.

Dr. Bunting advised that training should be based upon the standard 22-hour Red Cross course in first aid, which may be obtained through local Red Cross chapters. Special training in emergency casualty services, which may be given by physicians, oral surgeons and dentists who have been trained in these emergency health services, should include the treatment of shock and pain, the control of hemorrhage, emergency care of burns, cuts, contusions, and fractures, venipuncture and transfusions, maintenance of airway and the administration of anesthetics, he said. "Practical experience may best be obtained through observation of the treatment of accident cases in emergency receiving hospitals," he advised.

VOLUNTEERS FILL NEEDS OF ARMED SERVICES FOR DENTISTS

The armed services are meeting their requirements for dentists with volunteers, the Defense Department has announced,

Col. Arthur L. Irons, DC, (right) newly appointed chief of dental service at Walter Reed Army Hospital, and Brig. Gen. Oscar P. Snyder, DC., director of dental activities at Walter Reed Army Medical Center, of which the hospital is a part. Colonel Irons, who has been serving as chief of dental services for First Army Headquarters, replaces Brig. Gen. Neal A. Harper, DC, who has been reassigned to the Army Surgeon General's Office in Washington, D.C.

and only one dentist actually has been drafted. Latest figures on the commissioning of dentists show that 2,474 draft-eligible dentists have gone into uniform voluntarily.

Selective Service figures revealed that as of October 31, of 3,925 registered dentists in Priority I, 1,099 were on active duty, 1,099 were commissioned but on inactive duty, 285 were deferred for essentiality, and 561 were classified 4-F. Of the 727 dentists in Priority II, 133 were on active duty, 144 were commissioned but inactive, 82 were deferred for essentiality, and 137 were in 4-F classification.

International

BRITISH BILL PROPOSES NEW ANCILLARY DENTAL PERSONNEL

Legislation before the British House of Lords proposes the creation, for an experimental period of three years, of a body of ancillary dental workers to perform extractions and fillings under supervision. This plan is reported to derive from the favorable report on the New Zealand dental nurses plan brought back by the five British dentists who studied it.

The new bill, according to the *British Medical Journal*, was framed so as not to recede from the "resolutely high standards" of the 1921 Dentists Act, which bars any form of unqualified dental practice. Persons in the new category will be employed only in hospitals and public dental clinics, the article states, and at the end of a three-year period the results will be examined before permanent recognition is accorded to the new group of dental workers. The bill was introduced on November 27.

A four-page pamphlet issued recently by the British Dental Association called for "speedy action" along the lines laid down under the 1921 Dentists Act, and urged active government cooperation in the recruitment and training of ancillary personnel to alleviate the crisis in the school dental service. The Act, which was intended to protect the public against the dangers of unregistered practice, "provides for the use of unregistered persons in the performance of any public dental service or minor dental work under the direct personal supervision of a registered dentist . . . ," the pamphlet stated. At the same time, the B.D.A. outlined a comprehensive program to establish a proper dental service for school children, pointing out that such a program provides the only real and permanent solution to the crisis. Under the National Health Scheme, the school dental

service has been reduced, despite the repeated recommendation by the B.D.A. that children be given priority service, and in some parts of the country children are not even receiving routine dental inspections, the pamphlet explained.

INTERNATIONAL CONGRESS TO BE MAJOR EVENT THIS YEAR

Outstanding among events in dentistry this year will be the International Dental Congress to be held in London July 19-26, which will bring together members of the dental and allied professions from all parts of the world.

In the scientific program, the world's best dental brains will be represented. Audience participation will be encouraged, and is already being facilitated, by prepublication in the *International Dental Journal,* beginning with the September 1951 issue, of the reports to be presented. Only summaries of the articles will be read by the authors during the session, in order to stimulate and leave ample time for discussion.

Table clinics and demonstrations also are scheduled, as well as scientific exhibits and films. A daily program of excursions and visits has been arranged for the 2,000 or more wives and guests who are expected.

In addition, facilities will be available for research workers and specialists to meet and discuss problems of mutual interest, and to show lantern slides, photographs and films.

Meetings will be held in the Royal Festival Hall, with a seating capacity of 3,500. Interpreters will make it possible for speakers to use any of the official languages: English, French, German, Italian and Spanish. The Congress is sponsored by the Fédération Dentaire Internationale.

Enrollment forms and Congress information bulletins may be obtained on request from Harold Hillenbrand, secretary of the American Dental Association, 222 East Superior Street, Chicago 11.

BRIT. M.J. EDITOR REVIEWS FOCI OF INFECTION ARTICLE

A two-page editorial in the December 8, 1951, issue of the *British Medical Journal* describes as "fully documented" the review of the literature entitled "An Evaluation of the Effect of Dental Foci of Infection on Health," which appeared in the June 1951 issue of THE JOURNAL.

"The collected information about studies of dental sepsis itself is comprehensive and most valuable," the editorial states. With regard to lesions of the root canal, it describes the conclusions drawn in the review as "cautious." In summary, the editorial concludes that "there will be sympathy in all quarters for the appeal

Dental office in the Norwegian Institute of Dental Research, Oslo. The Institute is equipped and operated with the proceeds from a Government operated national football pool based on the results of football games in England and Norway. See May 1951 issue of THE JOURNAL, page 586, and Letter from Norway, page 92 of this issue.

Social Security Building, Mexico City, D.F., site of the First Congress of the Mexican Dental Association, September 24-30, 1951. (See story, page 103)
Inset, left: Enrique C. Aguilar, president of the Congress; right, Ralph Cooley of Houston, Texas, who represented the American Dental Association.

to the medical profession to regard the dentist as a consultant and not as a technician; to obtain his advice on what teeth should be extracted and not merely to instruct him to extract many or all that a patient possesses."

CANADIAN RESEARCH COUNCIL OFFERS FELLOWSHIPS IN 1952

The Canadian National Research Council has announced that a limited number of fellowships for graduates in dentistry are available, as well as grants-in-aid for dental research.

Fellowships ranging from $1,000 to $2,500 a year will be granted to provide training and experience in research in one of the sciences basic to dentistry, the announcement states. They will be tenable in non-Canadian universities if the training desired is not available in Canada. Grants-in-aid for dental research will be made to persons conducting investigations in established laboratories only.

Deadline for receipt of applications is February 1, 1952. Further details and application blanks may be obtained by writing to S. J. Cook, secretary, Associate Committee on Dental Research, National Research Council, Ottawa, Canada.

E. B. DOWSETT, BRITISH DENTAL ASSOCIATION PRESIDENT, DIES

Great Britain lost one of its great dental leaders on November 13, with the death of Col. Ernest Blair Dowsett of London, president of the British Dental Association.

E. B. Dowsett

His election as president of the B.D.A. culminated a long and useful career of service to his profession and to his coun-

try. A registered dentist since 1899, he was consulting dental surgeon to Guy's Hospital, London, and later lecturer on dental surgery to that hospital. He was external expert in dentistry to London University, honorary treasurer of the British Dental Association, and chairman of the Dentists Provident Society. He was a Fellow of the Royal Society of Medicine of England, president of the Metropolitan Branch of the B.D.A. in 1921-22, examiner in dental surgery to the Royal College of Surgeons, and to London, Liverpool, Birmingham and Sheffield Universities.

MEXICAN DENTAL ASSOCIATION HOLDS ITS FIRST CONGRESS

Seventeen South and Central American countries, as well as the United States and Canada, were represented at the First Dental Congress of the Mexican Dental Association, held in Mexico City September 24-30, 1951, according to Ralph C. Cooley of Houston, Texas, who represented the American Dental Association at the Congress. The Canadian Dental Association and the American Dental Society of Europe also were represented. President of the Congress was Enrique C. Aguilar, who is president of the Mexican Dental Association. Foreign secretary of the Congress was Roberto Ruff.

Roberto Ruff

Highlight of the meeting, according to Dr. Cooley, was the formation of a coalition of dentists of the Western Hemisphere, at the instigation of Dr. Ruff, with two voting delegates from each of the Pan American countries, who elected as their chairman Carlos Corro, dean of the University of Cuba dental school. It is planned that these delegates meet next year in Havana, Cuba, for the purpose of completing a permanent organization to meet henceforth each year at some designated place in the Western Hemisphere, Dr. Cooley reported.

The Congress was held in conjunction with the four-hundredth anniversary of the Mexican University. A new hundred million dollar university is being built in Mexico, with a "splendid dental college" included in its plans, Dr. Cooley reported.

Approximately 55 dentists from the U. S. attended the Congress, 27 of whom contributed to the scientific program.

Public Health

NATIONAL RESEARCH COUNCIL GROUP APPROVES FLUORIDATION

A special committee of the National Research Council has endorsed the fluoridation of public water supplies as a dental health measure for the partial prevention of caries. A report released on November 29 by M. C. Winternitz, chairman of the Council's division of medical sciences, stated that when properly controlled, the addition of fluorides to drinking water which lacks fluorides appears to be safe and effective. At the same time, the committee cautioned that its safety depends on proper controls and its effectiveness on proper selection of water supplies for treatment. It urged that provisions be developed for providing the dental health measure in rural areas without public water supplies.

The committee stated that fluoridation

should be considered by any community which includes a child population of sufficient size, and which obtains its water supply from sources that are free from or extremely low in fluorides. There is no evidence that fluorides are harmful in the amounts (1 ppm) needed to reduce caries incidence, it stated, but fluoridation should be undertaken only under expert dental and engineering supervision by the state board of health, with constant chemical control. Less fluoride should be added in warm climates where more water is consumed, the report stated.

PHILADELPHIA AND BALTIMORE TO FLUORIDATE CITY WATER

Three million more people will receive partial protection against dental decay as a result of the November 29 appropriations by the Philadelphia and Baltimore city councils for fluoridation of their water supplies.

In Philadelphia, the city council appropriated $150,000 for the fluoridation project. Rufus S. Reeves, director of public health, and a committee headed by LeRoy M. Ennis, president of the Association, and Charles H. Patton, 1950 president of the Pennsylvania State Dental Association, are credited with promoting acceptance of the public dental health measure.

In Baltimore, the sum appropriated was $90,000. The Maryland State Dental Society, the Baltimore City Dental Society, and Berton McCauley, director of dental care in the Baltimore Health Department, urged adoption of the dental health measure over a year ago. Final approval was given after the recent favorable report by a special committee of the National Research Council. February 1 is the date set for the start of fluoridation, according to E. L. Pessagno, Jr., secretary of the Maryland State Dental Association.

Fluoridation in Prince Georges and Montgomery Counties, Md., is expected shortly; a city ordinance in Hagerstown has been passed which provides for

Dental health education exhibit, displayed for the first time at the ninety-second annual session of the Association in Washington, D.C., last October. The exhibit is a product of the Council on Dental Health.

Lights flashing behind the color transparencies at the right draw the viewer's attention to questions and answers, alternately, regarding the nature, causes, prevention, and treatment of periodontal diseases.

The 6 ft. wide exhibit is available from the Central Office for meetings of national, state and local health organizations. Requests should be addressed to the Order Department, American Dental Association, 222 East Superior Street, Chicago 11, Ill.

fluoridation of the water supply in that city, Dr. Pessagno said.

DAIRY COUNCIL SPONSORS DENTAL HEALTH DAY PROGRAMS

Dental societies, health organizations and civic groups cooperating in the fourth annual observance of National Children's Dental Health Day on February 4 include the National Dairy Council, which has announced plans for special window displays and nationwide radio and television programs.

The Council and its 58 affiliated units will cooperate with dental societies in all parts of the country in distributing pamphlets and other educational material emphasizing the importance of proper diet in maintaining dental health. In addition, the February issue of *Nutrition News*, a quarterly publication of the N.D.C., will feature an article entitled "Dental Health Education," by O. E. Hoffman, dental director of the Washington State Department of Health.

Educational and promotional material prepared by the Council on Dental Health and the Bureau of Public Information of the Association was distributed last October, to aid in program planning, community participation and publicity.

A.M.A. HOUSE OF DELEGATES ENDORSES FLUORIDATION

The House of Delegates of the American Medical Association last month placed itself on record in favor of the fluoridation of community water supplies as a measure for the partial prevention of dental caries, particularly in the younger age group. A resolution endorsing the procedure "in principle" was adopted at the 1951 interim session of the A.M.A. in December, following an earlier statement of approval by the Council on Pharmacy and Chemistry and the Council on Foods and Nutrition of that organization. (See December 1951 JOURNAL, p. 733.)

Veterans Administration

VA AUTHORIZES EXTENSION OF 60-DAY TREATMENT LIMIT

Chiefs of dental service in Veterans Administration were instructed on November 14 that the 60-day time limit for completion of treatment may be extended when necessary.

A letter from Vice Admiral Joel T. Boone, chief medical director of VA, to all the chiefs of dental service, explained that time limits are established to provide adequate control over funds, and that they aid the dentist in obtaining cooperation from the veteran patient. At the same time, "no restrictions are placed [upon regional office chiefs of dental service] in authorizing a longer period if the requirements of the individual case indicate that more time would be required to complete the indicated treatment," he said.

Admiral Boone prefaced his instructions by quoting the resolution adopted by the House of Delegates of the Association which sought amendment of VA regulations to extend the time limit for completion of dental service to 90 days.

General

SLOMAN NAMED TO HOSPITAL CARE FINANCING COMMISSION

Ernest G. Sloman of San Francisco, dean of the College of Physicians and Surgeons dental school, has been appointed a member of the recently organized Commission on Financing of Hospital Care.

Plans announced after the first meeting of the Commission on November 29 were for a two-year study on hospital financing, to begin with a statewide pilot study in North Carolina this month.

The 30 national leaders who comprise the membership were chosen, to represent the hospital patient and the public, from the fields of dentistry, agriculture, education, finance, government, hospitals, industry, insurance, labor, medicine, nursing, press and religion, the announcement stated.

The Commission is supported by grants from philanthropic foundations and individuals with an interest in the public health. Chairman is Gordon Gray, president of the University of North Carolina and former Secretary of the Army; director is Graham L. Davis, on leave from his post as director of hospitals at the W. K. Kellogg Foundation. Headquarters are in Chicago.

E. J. JENNINGS, FORMER ASSOCIATION TRUSTEE, DIES

Edward J. Jennings of Trenton, N. J., former trustee of the Association and past president of the New Jersey State Dental Association, died on December 12 at the age of 58.

Dr. Jennings had been active in the practice of dentistry since 1919 when he was graduated from the University of Pennsylvania dental school. He was a past president of the New Jersey State Dental Society and a trustee of that society from 1928 until the time of his death. He was editor of the State Dental Society from 1929 to 1932, and served on virtually every important committee. He was a past president of the Mercer Dental Society.

He served as trustee from the Fourth District of the Association from 1941 to 1947.

For the past ten years, Dr. Jennings served as Postmaster of Trenton. He was active in both civic and fraternal affairs in his state.

He is survived by his widow, a daughter and three sons. Two sons are students at Temple University dental school, Philadelphia.

M. D. CLAWSON, EX-PRESIDENT OF MEHARRY, DIES AT 51

M. Don Clawson of Oak Ridge, Tenn., internationally known dentist, and past president of Meharry Medical College, Nashville. Tenn., died on December 17 at the age of 51.

After graduation in 1926 from the Washington University, St. Louis, dental school, he practiced in Bonne Terre, Mo., until 1928 and then spent two years in the British Isles. From 1930 until 1941 he practiced in Beirut, Lebanon, and served the American University of Beirut successively as professor of operative dentistry, acting director, and demonstration lecturer, and the University of St. Joseph in Beirut as demonstration lecturer in the dental department. He served also as demonstration lecturer at the dental department of Syrian University in Damascus, and as director of dental services for the Iraq Petroleum Company in Iraq, Syria, Lebanon, Palestine, and Trans-Jordan.

In 1942 he returned to this country to become director of dental education at Meharry Medical College in Nashville,

Tenn., and professor of operative dentistry and pedodontics. He directed the dental services at the Oak Ridge reservation of the Manhattan atomic energy project. He served as president of Meharry Medical College from 1945 to 1950, and at the time of his death he was a member of the board of trustees.

Dr. Clawson returned to the private practice of dentistry in Oak Ridge early in 1951. He stated at the time that his future plans included efforts toward the reopening of the dental school in Beirut as soon as the international situation permitted.

He is survived by his widow, and a daughter in medical school.

H. O. LINEBERGER, N. C. DENTAL LEADER, DIES

Henry O. Lineberger of Raleigh, N. C., active in affairs of dentistry for many years, died on December 7 at the age of 70.

A graduate in the 1914 class of the University of Louisville dental school, Dr. Lineberger's leadership was soon recognized, and in 1916 he was elected to the House of Delegates of the Association. In succeeding years he served on the Judicial Council, and during World War II on the Committee on National Defense, the Dental Preparedness Committee, and the War Service Committee. He served as a member of the Prosthetics Dental Service Committee and was its chairman in 1947.

He was a past president of the Raleigh Dental Society and the Fourth District Dental Society of his state, and served the North Carolina Dental Society as its secretary in 1921-24 and as its president in 1925-26. He was secretary of the North Carolina State Board of Dental Examiners, and during World War II served as chairman of the military affairs committee and on the directing board for the procurement and assignment of dentists. During World War I he saw service in Europe as a captain in the Dental Corps.

He served his state on the Hospital Board of Controls in 1945, and as chairman of the North Carolina Dental Society advisory committee to the University of North Carolina dental school.

He was a member of the American College of Dentists and a past president of that organization.

He is survived by his wife, two sons—one of them a dental student—and a daughter.

M. E. LUSK, MINNESOTA DENTAL LEADER, DIES

Myron E. Lusk of Minneapolis, one of Minnesota's young dental leaders and member of the Judicial Council of the American Dental Association, died on November 25 at the age of 49.

M. E. Lusk

Dr. Lusk was graduated from the University of Minnesota dental school in 1926 and in his 25 years of service in the profession took active part in national and international activities as well as affairs of dentistry in his own state. He served for several years on the House of Delegates of the Association and was appointed to the Judicial Council shortly before his death. He was a member of the Fédération Dentaire Internationale and of the American College of Dentists.

He was a life member of Delta Sigma Delta and was recently elected supreme grand master of that national dental fraternity. Locally, he was a member of the Chamber of Commerce and the Executives Club. He was a member of Zuhrah Temple of the Shrine.

He is survived by his widow, a daughter, his mother and a sister.

MICH. ASSOCIATION OFFICER, H. C. GERBER, JR., DIES

Henry C. Gerber, Jr., 55, executive secretary of the Michigan State Dental Association for the last 13 years, died December 16 in Lansing, Mich. A native of Toledo, Ohio, Mr. Gerber was graduated from Ohio State University with a degree in business administration, and served with the U. S. Navy in World War I. Before assuming his position with the Michigan State Dental Association in 1938, Mr. Gerber had served as executive secretary of the Toledo Academy of Medicine.

ORTHODONTISTS MOVE PRIZE ESSAY DEADLINE TO MARCH 25

The American Association of Orthodontists has moved the deadline for receipt of entries in the $500 prize essay contest to March 25, according to a recent announcement.

Essays submitted are to represent "an original investigation and contain some new significant material of value to the art or science of orthodontics," the announcement stated. The contest is open to any teacher, researcher, undergraduate or graduate student affiliated with a recognized dental institution, as well as to members of the A.A.O. The winning author will be invited to present his essay at the A.A.O. meeting in St. Louis April 22-24.

Details concerning the form in which the essay must be presented may be obtained by writing to J. A. Salzmann, chairman of the research committee, American Association of Orthodontists, 654 Madison Avenue, New York 21.

BROADBENT AND NOYES RECEIVE NORTHWESTERN AWARDS

E. Holly Broadbent of Cleveland and Frederick B. Noyes of Chicago received Centennial Awards at the Centennial Convocation of Northwestern University on December 2. The awards were given to 100 recipients in recognition of "the impress they have made upon their generation during a lifetime of distinguished service as residents of one of the states which comprised the original Northwest Territory."

BOARD OF PROSTHODONTICS TO MEET AT END OF MONTH

The American Board of Prosthodontics will meet January 28-February 2, in Milwaukee, at the Marquette University School of Dentistry.

Details may be obtained by writing to the secretary, Irving R. Hardy, 136 Harrison Avenue, Boston 11.

DENTAL PLASTICS RESEARCH GROUP TO MEET FEBRUARY 3

The American Academy for Plastic Research in Dentistry will hold its annual meeting on February 3, in Chicago, with a scientific program devoted to an exploration of the subject of dental plastics. Headlining the program will be an outstanding chemist and physiologist who will discuss the properties of auto-polymers as applied to their respective fields, according to LeMar W. Harris of Chicago, the organization's secretary.

The all-day meeting will be held in

William Richard Wright (r.) of Jackson, Miss., with the plaque presented to him last April by the Mississippi Dental Association with the understanding that it be placed in the library of the State Board of Health. With him are (l. to r.) G. A. McCarty, 1950-51 president of the state dental association, who presented the award, and Estes M. Blackburn and Felix Underwood, dental member and director, respectively, of the State Board of Health.

Dr. Wright received the honor in recognition of his 24 years of service to the state health department, and more than 50 years of active practice. He was chosen in 1950 to represent his state as "the man who has made the most outstanding contribution to the progress of dentistry in Mississippi" in the section entitled "Notable Contributors to Fifty Years of Progress" of the mid-century issue of THE JOURNAL in June of that year.

the Pittsfield Building conference room, 55 East Washington Street. Details may be obtained by writing to Dr. Harris at 25 East Washington Street, Chicago 2.

AMERICAN DENTURE SOCIETY TO MEET FEBRUARY 2-3

The American Denture Society will hold its next meeting in Chicago on February 2-3, according to Arthur L. Roberts, secretary.

Details may be obtained by writing to Dr. Roberts, Aurora National Bank Building, Aurora, Ill.

ANESTHESIOLOGY ACADEMY TO MEET IN NEW YORK NEXT MONTH

The International Academy of Anesthesiology has announced that its next meeting will be held on February 6 at the Statler Hotel, 33rd Street and Seventh Avenue, New York.

Details, and information regarding membership, may be obtained by writing to the executive secretary, Irwin G. Tomack, International Academy of Anesthesiology, 355 East 149th Street, New York.

NORTHEASTERN ORTHODONTISTS TO MEET MARCH 3-4 IN N. Y.

The Northeastern Society of Orthodontists will hold its annual meeting March 3-4, at the Hotel Commodore, New York. Details may be obtained by writing to the secretary-treasurer, Oscar Jacobson, 25 West 81st Street, New York.

DENTAL NEWSLETTER AIDS INTERNATIONAL CAUSE

The State Department's monthly *Dental Newsletter,* prepared in cooperation with the Association for distribution throughout the world, is making an important contribution to international understanding, the State Department has reported.

A letter received recently at the Central Office from Everett L. Reb, chief of the press features section of the International Press and Publications Division, states:

I would like to express on behalf of the Department of State our sincere thanks for your cooperation in the technical newsletter program. The *Dental Newsletter* is making positive contributions to the cause of international understanding.

One of the latest comments came from the Office of the State Department in Seville, Spain. It states that "this type of activity is very effective in promoting respect for and knowledge of U.S. professional standards and achievements," Mr. Reb reported, adding that appreciation was expressed at firsthand to a State Department employee in Seville by a dentist who had the Spanish version of the publication on his desk.

ANESTHESIA IN DENTISTRY GROUP TO MEET MARCH 24

The American Society for the Advancement of General Anesthesia in Dentistry will hold its spring meeting on March 24, at the Hotel Shelburne, 37th Street and Lexington Avenue, New York.

Details may be obtained by writing to the executive secretary, M. Hillel Feldman, 730 Fifth Avenue, New York.

MID-ATLANTIC ORAL MEDICINE SEMINAR TO MEET MAY 11-16

The third Mid-Atlantic States Seminar in Oral Medicine will be held May 11-16 at the Skytop Club, Skytop, Pa., according to an announcement from the University of Pennsylvania dental school, which sponsors the annual seminar.

General theme of the seminar will be the anatomy, function and efficiency of the masticatory apparatus, and the application of this knowledge to clinical problems. Clinicians and their subjects include Oscar V. Batson, diagnosis and treatment of minor abnormalities of the temporomandibular joint; Henry M. Goldman, application of the knowledge of abnormalities of the chewing apparatus as a cause of periodontal disease; Ernest R. Granger, recording condylar path and centric relation, and the significance of this information in restorative and prosthetic dentistry; Richard S. Manly, the efficiency of the chewing apparatus; and Robert E. Moyers, the relation of abnormalities of the chewing apparatus to orthodontic problems.

Attendance is limited to members in good standing of the Association, the American Medical Association, or "similar or comparable groups," the announcement states. The fee of $250 includes registration, lodging and meals for five days. Veterans who can furnish a satisfactory certificate of eligibility and entitlement will receive a credit of $150 toward the total fee. Applications will be accepted in the order in which they are received.

Details may be obtained by writing to Lester W. Burket, director, postgraduate courses, School of Dentistry, University of Pennsylvania, 4001 Spruce Street, Philadelphia 4.

HERMAN L. REISS, NEW YORK ORAL SURGEON, DIES AT 58

Herman L. Reiss, New York oral surgeon, died on October 30 at the age of 58.

Dr. Reiss was president of the Council of the New York Institute of Clinical Oral Pathology, and one of its founders. He was consultant oral surgeon at Sydenham Hospital, having earlier served as director of dental oral surgery and member of the medical board of the hospital. Soon after his graduation in 1914 from the New York College of Dentistry, he was affiliated with the New York Throat, Nose and Lung Hospital, and served as an instructor in oral surgery in Columbia University extension courses. He was lecturer and instructor for the First District Dental Society postgraduate courses.

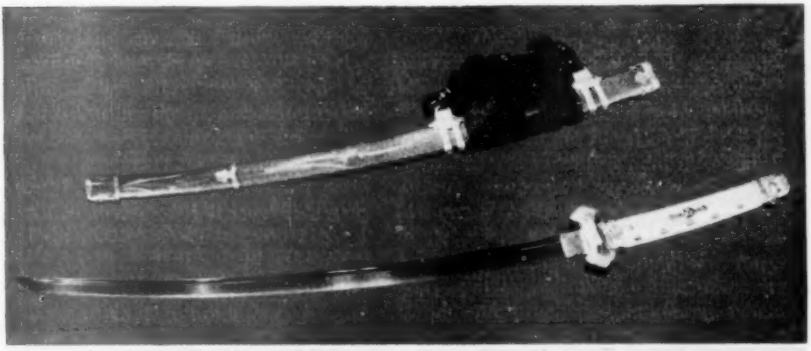
He is survived by his widow, Julia, and a granddaughter.

KANSAS CITY-WESTERN ALUMNI PLAN MARCH CLINIC MEETING

Members of the Association and their guests are invited to attend the seventy-first annual clinic meeting of the alumni association of the University of Kansas City School of Dentistry, Kansas City-Western Dental College, March 10-11, according to J. F. Jacobs, assistant to the dean. Last year's meeting attracted an attendance of well over 1,000 dentists, he reported.

Clinicians and their subjects are Irving R. Hardy of Boston, complete dentures; Victor L. Steffel of Columbus, Ohio, partial dentures; William J. Simon of Minneapolis, resinous fillings; and Herbert L. Hayward of Kansas City, children's dentistry.

Details may be obtained by writing to Dr. Jacobs, Office of the Dean, the University of Kansas City School of Dentistry, Kansas City-Western Dental College, Tenth Street and Troost Avenue, Kansas City 6, Mo.



感謝狀

贈

米國歯科医師會

社団法人日本歯科医師會

Sword presented to the Association by the Federation of Japan Dental Societies last July. The scroll, which accompanied the gift, translated into English by I. Tashiro of Chicago, reads: "A gift of thanks to the American Dental Association on this occasion when five delegates from your honorable society came to Japan with greetings to the Japan Dental Association. You have enlightened our group in Japan with your valuable research knowledge and technical knowledge and we appreciate your incalculable good wishes you have bestowed upon us. For these we thank you from the bottom of our hearts." The scroll bears the signature of Professor Sato, president of the Federation of Japan Dental Societies, and is dated "July 31, Twenty-sixth Year of the Era of Showa." At lower right is an inscription on white silk, which reads "Presented to the American Dental Association from the Federation of Japan Dental Societies." The gift of such a sword is a sign of sincerity, according to Dr. Tashiro.

Book Reviews

FESTSKRIFT UT GIVEN AV SVENSKA TANDLÄKARE SÄLLSKAPET MED ANLEDNING AV DESS 90-ARSDAG, 21 NOVEMBER 1950

216 pages. Stockholm, Sweden, A.-B. Fahlkrantz Boktryckeri, 1950.

This *Festival Edition* was published by the Swedish Dental Association to commemorate their ninetieth birthday, celebrated on November 21, 1950. It is a collection of articles dealing with the dental problems which confront Swedish dentists.

One of the interesting reports indicates that the addition of glucose or fructose to a mixture of tetanus toxin will increase the toxin penetration *in vivo*, while the addition of glucose, fructose and saccharose to methylene blue, toluidine blue fuchsin, apparently has no enhancing effect on dye penetration. Another concerns attempts to influence the permeability of enamel by topical application of fluorine on the teeth of dogs 7 to 12 months old. Still another article deals with an effective four year program of orthopedic treatment of unilateral fractures of collum mandibulae in children 3 to 8 years of age on the basis of fundamental principles.

Articles in the field of periodontics concern the development of a method for taking roentgenograms of identical angulation in cases which required repeated intraoral roentgenographic examination and a method for using a graduated explorer which will minimize the percentage of error that regularly occurs when different individuals measure the depth of periodontal pockets.

The dental histopathologic changes following experimental hyperthyroidism in albino rats, brought about by the addition of iodinated casein in the food and injection of synthetic Thyroxin (Roche) is reported.

An article on caries, pregnancy and lactation supplies evidence refuting the idea that valid grounds exist for the assertion that pregnant women run a greater risk of caries activity than nonpregnant women of a similar age. Efforts to produce a vibrator for condensing dental amalgams are described and cephalometric studies employed in diagnosing malocclusions of teeth are reported. One article concerns dimensional and weight changes in teeth after they are dried in the air and cremated, and other articles deal with problems which confront the oral surgeon.

The scope of the book is broad, the evidence presented in each article is good and the conclusions sound. For these reasons it is hoped that the excellent work of our Swedish colleagues will be multiplied and that their continued interest will help solve many of the controversial problems in the field of dentistry.

G. R. Lundquist

ORTHODONTIE (ORTHOPÉDIE DENTO-FACIALE)

By G. Izard. Third edition. 1,320 pages with 1,272 illustrations. Price 4,200 francs. Paris, France, Masson & Co., 1950.

This book is the seventh volume of a collection of nine volumes dealing with all fields of dentistry and mouth diseases. This monumental work has been accomplished under the direction of Dr. Chompret.

The author of this volume, Dr. Izard, is one of the outstanding orthodontists in France and his book is widely used in French dental schools. The first 200 pages are devoted to human anatomy and physiology. The growth of the face and occlusion are also thoroughly presented. The relation of orthodontics to the growth of the face is particularly emphasized. The author has made several original contributions to this field. Examination of the patient and orthodontic diagnosis are included in the second part of the book. The last part is a detailed study of malocclusion, its etiology and its specific treatment. The author has made his own classification of malocclusions.

Dr. Izard does not limit himself to the mechanics of treatment but also considers the medical, physiological, surgical and preventive aspects. The last chapter deals with failures that one might encounter in orthodontics and methods to prevent them.

Throughout this book, Dr. Izard has insisted that the great variety of cases in orthodontics makes it impossible to set up rigid rules. He believes that physiologic considerations make it necessary to use a variety of treatments. Therefore, he says, one must be well acquainted with muscular and bone physiology and know the exact effects on the tissues produced by mechanical treatments. The book is illustrated with original drawings by the author.

Ajax Menekratis

PUBLIC HEALTH AND WELFARE IN JAPAN: ANNUAL SUMMARY, 1950

General Headquarters, Supreme Commander for the Allied Powers, Public Health and Welfare Section. 432 pages. Index.

The year 1950 was a period of greater stabilization in Japan and this was reflected in public health activities, as well as in other areas of professional and economic endeavor. There was noticeable improvement in the realization by public and private leaders of the importance of improved public health to economic and social recovery. The tendency was away from economic and social controls and toward an internal freedom of enterprise. There was progressive relaxation of SCAP controls, based on the ability of the Japanese people to act more independently. The Japanese Government removed economic controls on industry as the internal status warranted.

Dramatic results were achieved in the field of communicable disease control. By early 1950 nearly the entire population of Japan had been revaccinated against smallpox. The year 1950 had the lowest number of smallpox cases reported for any year during the period for which records are available. The over-all rate for typhus fever cases in 1950 was 1.1 per 100,000 population.

There has been no cholera in Japan since 1946. Port authorities are alert to possible introduction of this disease and adequate stocks of vaccine are maintained to initiate local immunization programs if required. Also, a remarkable drop took place in the number of reported cases of malaria for 1950. Statistics again show a fall in the death rate of all forms of tuberculosis from 167.2 per 100,000 in 1949 to 145.4 per 100,000 in 1950.

The Public Health and Welfare Information Program gained in strength and popularity in 1950 and is now rated as one of the major programs of the country.

The responsibility for conducting an annual census of physicians and dentists was transferred in 1950 to the Statistics and Investigation Division of the Ministry of Welfare. Tabulations for the 1949 census showed 69,155 physicians and 25,807 dentists as of December 31, 1949.

Six dental colleges raised to temporary university rank during 1949 continued in operation during 1950. As in the case of medical schools, attention was concentrated on teaching methods and curricular content. National examinations for dentists were held in April and October with a total of 1,608 participating, of whom 81.9 per cent passed.

The professional practices of medicine, dentistry and pharmacy have not been well defined in Japan. Dentists have dabbled in medical practice by administering drugs and engaging in surgical procedures, as well as by administering physiotherapy. Pharmacists, until the passage of the Pharmaceutical Law in July, 1948, were permitted to prescribe for patients and to sell potent drugs without prescriptions.

Early in the Occupation, these unwise practices were recognized and an over-all council known as the Medical and Pharmaceutical Systems Deliveration Council was established to study the problem and to advise the Ministry of Welfare of the steps to be taken which would lead to the separation of the three professions into their respective fields of activities as accepted by the modern medical world.

John C. Bergmann

UBER DIE BEZIEHUNGEN ZWISCHEN ZAHNKARIES UND FLUORIDEN (THE RELATION BETWEEN DENTAL CARIES AND FLUORIDES)

By Peter Adler. 65 pages. Leipzig, Germany, J. A. Barth, 1950.

This publication is a review of the literature and known facts about fluorides and caries. The literature on the subject in English is reviewed for the benefit of German-speaking dentists. This literature was not available during World War II and even now is available only with difficulty in the Eastern parts of Europe. In addition to the English literature, the author reviews some of the local experiments, which largely conform to what has been published in this country.

B. Orban

LEHRBUCH DER ZAHNHEILKUNDE (TEXTBOOK OF DENTISTRY)

Edited by Dr. H. Euler. Sixth edition. 815 pages with 794 illustrations. Index. Muenchen, J. F. Bergmann, 1951.

This textbook, now in its sixth edition, is a German classic. With remarkable skill and restraint, the main subjects of dentistry are treated in 800 pages. From well illustrated chapters on gross and microscopic anatomy we are led to a section on oral physiology and then into the field of clinical dentistry. This part, more than three quarters of the book, is subdivided into four sections; special pathology and therapy of dental and oral diseases,

operative dentistry, dental prosthetics, and maxillomandibular orthopedics. This reviewer feels competent only to evaluate the first sections. With the exception of the temporomandibular articulation which is treated in the section on physiology, the first part discusses efficiently the anatomy and histology of the jaws, teeth and related structures. Figure 49 should be replaced because it shows the palatine glands extending too far forward. The positive attitude on the question of the presence of nerves in the dentin seems, in the face of much contrary evidence, too strong. The anatomy as well as the physiology of the temporomandibular articulation do not seem adequately treated. Much new information could have been incorporated to great advantage. The book is of great value especially for dental educators who want to have a picture of dental education in Germany.

Harry Sicher

THE SOVIET STATE AND ITS INCEPTION

By Harry Best. 448 pages. Index. Price $6. New York, Philosophical Library, 1950.

As a professor of sociology, the author of this book has succeeded in presenting a sober and objective primer on Russia from which the reader may form his opinion of that vast but little known country. Dr. Best has developed his thesis logically by discussing Russia's history, geography, government, religion, agriculture, industries, social and economic conditions, ingestion of revolutionary doctrine and the development of the Soviet state. He traces how the development of the communistic philosophy resulted in a complete revamping of Russia's political, religion, educational and social welfare systems as well as its international relations.

The author has been extremely cautious throughout the book to state facts as he has found them, and he has provided a picture of the Soviet state as he sees it today. He has divided his material into two parts, "Russia, before the revolution" and "Russia, after the revolution," and has devoted the last chapter to an appraisal of the Soviet state. Commenting on the educational and social improvement which, during the past 30 years, has partially transformed that country's paralyzed masses into a people who are just beginning to become interested in life, he points out strikingly that these advances are obscured by accompanying violence, the blocks of a communistic system and a lack of personal freedom. If we wish to maintain a system of free enterprise in this country we must learn the lessons to be gained from an understanding of the Soviet system and guard against political measures that encroach upon our personal liberties. By pulling aside only slightly one edge of the iron curtain, Dr. Best enables the reader to obtain a fleeting glance at the struggles, problems and progress of a little known and less understood people.

TRATTATO DI OTONTOLOGIA. VOLUME 1. (ENCYCLOPEDIA OF DENTISTRY)

By Silvio Palazzi. Fourth edition. 975 pages with 685 illustrations. No price listed. Milan, Italy, Ulrico Hoepli, 1950.

In general this book attempts to cover all phases of dentistry. It is well illustrated and contains a comprehensive index by subject and author, and an extensive bibliography.

It is questionable whether or not a book of this type, representing a compilation from many sources, is used for teaching purposes in Italy. It would be of no value in the undergraduate teaching curriculum in this country, although certain chapters might prove applicable for use by dental schools.

Postgraduate students and general practitioners in Italy might have use for a book of this type but in this country something more condensed and to the point would be preferred.

Dr. Palazzi has spent a tremendous amount of time and energy in compiling the knowledge accumulated by outstanding men in the dental profession and he is to be congratulated on having had the perseverance to complete such an arduous task.

There are 37 chapters in this book which cover the history of dentistry, anatomy, physiology, biology, pathology, anesthesia, symptoms of diseased teeth, roentgenography and therapy. A wealth of information is included pertaining to the dental profession.

F. M. Amaturo

Current Literature

SERIAL STUDY OF GOOD OCCLUSION FROM BIRTH TO 12 YEARS OF AGE

J. H. Stillman. Am. J. Orthodont. 7:37, July, 1951.

Occlusion is constantly changing. How and when these changes take place need further exploration. By making a detailed study of the individual growth and developmental pattern from birth onward, we may obtain a clearer concept of how the individual arch develops. For this purpose the author selected, from his group of 60 white children, two males and two females. Each had a varied dental history with a common end result, good occlusion. These four healthy children have been followed continuously from birth to 12 years of age. At no time did any of them receive appliance therapy.

In order to visualize the total picture of how dental arches change in size and morphology with time, occlusal outlines were made of dental arches passing through anatomic Points I, II, III and IV at ages 3 days; 4 years, 1 month; 7 years, 9 months; and 12 years, 19 days, respectively. Each age was then superimposed upon the others using Points I to IV and the sagittal plane for orientation. It can readily be seen that change was constantly taking place, because at no time did both the length and the width of a particular dimension remain unchanged jointly.

William F. Ford

THE SIGNIFICANCE OF THE ENAMEL LAMELLAE

E. B. Manley, M.Sc. Manc., B.D.S., F.D.S., and J. L. Hardwick, M.D.S., Ph.D. British D. J. 91:2, July 17, 1951.

In recent years it has become increasingly evident that no solution of the cause and nature of dental caries is possible without utilizing and correlating the combined resources of histology, chemistry and bacteriology in this particular field. Much confusion has been caused by claims of a final solution resulting from a single approach. The present histological investigation is based primarily on the results of a chemico-physical approach and a correlation between the two has been effected.

The first part of this paper is concerned mainly with the part played by certain organic structures known as enamel lamellae. An attempt is made to put these elements in true perspective with other factors concerned. A method has been evolved whereby it is shown that an attack on enamel structure may, in certain instances, occur prior to any visible clinical evidence of a lesion and this may involve the dentin without any gross change in the macroscopic form of enamel.

A photomicrograph is shown of an etched transverse ground section of a sound caries-free bicuspid showing a lamella with an associated lesion in the dentin. This appearance has hitherto been described as the dentinal part of a lamella. It has been shown that in a clinically caries-free tooth a lesion can be produced in the dentin by microorganisms which invade and pass down an enamel lamella. This is true proteolysis.

A color transparency is reproduced of a transverse ground section stained with van Gieson. Here involvement of the dentin has taken place to a considerable extent and has taken a crimson stain as distinct from the magenta of the normal dentin. The enamel surface was unbroken and there was no indication of cavitation in the tooth before grinding. In the light of further evidence, and as a result of the examination of decalcified serial paraffin sections, the appearance seen in this stained ground section is interpreted as representing two distinct lesions which have involved the dentin. One is associated with an infected lamella, and the other is associated with the tract of altered enamel, which is regarded as representing early manifestations of the acidogenic factor. The distinction is made clear by a series of decalcified paraffin sections cut transversely to the long axis of a tooth through the carious lesion.

ATELECTASIS FOLLOWING REMOVAL OF IMPACTED TOOTH

James L. E. Bock, Major U.S.A.F. (DC), and I. Louis Hoffman, Lt. Col., U.S.A.F. (MC). U. S. Armed Forces M. J. 2:7, July, 1951.

This case is reported because of the rarity of massive collapse of the lung following dental extraction under local anesthesia and to stress the importance of efficient liaison between

medical and dental departments of a military hospital. Atelectasis is the condition which prevails when air cannot enter the lungs to replace that which is absorbed in the alveolar capillaries. It results in partial or complete collapse of a lobule, lobe or entire lung.

One would hardly expect such a complication following a relatively simple dental extraction under local anesthesia. This patient had no apparent allergy. The premedication with morphine, atropine, and pentobarbital sodium was considered optimal. During the surgical removal of the two teeth, the patient seemed to be uncomfortable and a little anxious. The extractions were performed with the patient sitting. An aspirator was used throughout the operation and adequate suction was obtained. At no time was the gag and swallowing reflex abolished. The amount of postoperative bleeding was slight. The cause of atelectasis in this case was the aspiration of blood and mucus as shown by bronchoscopy.

This case illustrates that serious complications can arise from a comparatively simple dental operative procedure. Massive collapse of the lung is relatively uncommon as a postoperative complication but must be considered in the practice of dentistry. Measures are suggested in the hope of preventing such an occurrence.

METABOLISM OF ALVEOLAR BONE

H. J. Rogers and S. M. Weidman. Brit. D. J. 90:7, January 2, 1951.

This metabolic study involves primarily the use of tracer elements with respect to the isotypes of calcium, iodine, nitrogen and phosphorus. The application of these technics to study of the skeletal characteristics is discussed in brief detail, and the recent work of other investigators is reviewed. The bones of the cat, rabbit, rat and ferret were used in these respective studies. Three tables present the differential characteristics of the femur as compared with the alveolar bone. There is likewise a projected difference in the diaphyseal and metaphyseal portion of bone. These tables indicate there is a relatively constant composition factor in respect to the femoral bones of these four experimental animals while there is little species to species comparison of the alveolar bone. Plasma content of the bone is used as an important means of determining metabolic variance as compared to the histologic variations in femoral and alveolar bone. The individual trabeculae of the metaphyseal and alveolar bones are not supplied with the same systems of canals as are the diaphyseal portion of the long bones. The rate of metabolism of trabeculae is determined and it seems to be much faster in diaphyseal bone. However, there seems to be little difference between the histologic characteristics of the trabeculae of alveolar bone and other types of bone studied, despite the fact that there is a difference in the trabecular metabolism. There seems to be a correlation between the composition of bone and the rate of turnover of the constituent parts of the diaphysis and metaphysis. In the alveolar bone that was examined, this difference could not be found. It is indicated that the conception of central inorganic exchange of the plasma is perhaps inadequate on the basis of this study. The individual animals appeared to show variation in rate of skeletal metabolism, the different species having different rates. The rate of metabolism of mandibular molar alveolar bone is slower than that of metaphyseal bone, but more rapid than that of the diaphyseal bone. This seemed to be true for all of the animals examined. Further work on this problem is in process and a more complete account of the metabolic results will be published at a later date.

O. B. Wiswell

DIRECT TISSUE RADIOAUTOGRAPHY TECHNIQUE APPLIED TO TEETH

Noel D. Martin and E. S. Slater. Science 113:2947, June 22, 1951.

Radioactive isotopes have been used in the study of the permeability of the enamel and the dentin, and the pathways by which these isotopes penetrate the tooth structure have been recorded by the radioautographic method.

In an investigation of the permeability of the dentin and enamel to P_{32}, labeled NaH_2PO_4, following the treatment of the teeth by fluorides and other compounds, the authors thought that the application of the method of Evans might provide a technic that would permit a direct viewing of the isotope penetration and, furthermore, microscopic examination of the sections that would give additional information as to the mode of penetration. This technic consists essentially of placing a very fine grain stripping-film emulsion on the surface of the ground tooth section and exposing the section to the radiation of the absorbed isotope. This emulsion is developed still in contact with the tooth section, and thus a direct view of the penetration is possible.

Two cavities were prepared in an anterior tooth. One served as a control. The other was

treated with 2 per cent NaF and then 2 per cent $CaCl_2$, a precipitate of CaF_2 forming in the cavity. Into each cavity 0.02 ml. of radiophosphorus in the form of NaH_2PO_4 with a specific activity of μc was sealed. Twenty-four hours later film emulsion was laid in contact with a ground section of the tooth, exposed for a period proportional to the radioactivity of the section and developed.

The resultant composite radioautograph and section show a diffuse penetration of P_{32} in the control cavity, while precipitation of calcium fluoride in the treated cavity has decreased the diffusion to a very great extent. If the cavity is treated with sodium fluoride only, then similar penetration is observed in both cavities. This preliminary work indicates the possible use of the "direct section" autoradiograph and also the effect of a layer of calcium fluoride in decreasing the permeability of the dentin.

S. S. Arnim

ANALYSIS OF THE COMPONENTS OF FORCES USED TO EFFECT DISTAL MOVEMENT OF TEETH

Saul M. Bien. Am. J. Orthodont. 7:37, July, 1951.

The technic for the application of force by orthodontists to effect the movement of teeth has been developed progressively for over a hundred years.

Distal movement of teeth is obtained at present in most orthodontic cases by the use of small elastic bands attached to a basic appliance. Elastics are used generally in three different possible anchorage-movement combinations, the intramaxillary, the intermaxillary, and the extraoral types of elastics. The so-called Class II elastic is generally used from a point in the upper cuspid region to a point on the lower molar region.

The author concluded that: (1) the deleterious forces exerted are greater than the useful distal driving component of force in the distal movement of teeth; (2) the headgear with spring traction bar exerts the smallest amount of undesirable components; (3) the most favorable combination of forces for the distal movement of teeth would be the use of minimal intermaxillary elastic pressures during the day when the mouth opens frequently and the use of heavier intermaxillary elastics or a headgear, or both, with a spring traction bar during sleeping, reading hours, or when the patient is watching television.

William F. Ford

VERTICAL DIMENSION

Paul D. Lewis. Am. J. Orthodont. 7:37, July, 1951.

The influence of orthodontic therapy in changing the vertical dimension of the face is discussed. There are two types of bite planes employed in the construction of most bite plates: the flat plane and the steep, or inclined plane.

Among the more important indications for the bite plate in treatment are deep overbite; posterior mandibular displacement; lateral mandibular displacement; bilateral and anterior cross-bites or difficulty in banding certain mandibular teeth because of occlusion with the maxillary teeth.

The lack of optimum vertical height can be demonstrated clinically as well as by cephalometrics. Advantage should be taken of the knowledge and possibilities of the physiologic rest position and interocclusal clearance or freeway space, in the construction of the bite plate. This applies equally in non-extraction cases.

When a bite plate is used as an adjunct to orthodontic treatment, increased vertical dimension is obtained by eruption of the posterior teeth and the growth of the alveolar processes.

In case analysis and treatment planning, the existence of a mandibular displacement, either lateral or posterior, if present, should be recognized.

The ease with which certain teeth are moved by springs from the bite plate makes the appliance very adaptable, particularly in extraction cases when complicated by a closed bite.

The flat bite plane is preferable to the inclined plane because of the danger of the mandibular incisors' being tipped forward when occluding with the inclined type. It is also felt that the flat plane allows the mandible to seek its own position rather than to be "jumped forward," the possible exception to this being certain Class II Division 2 malocclusions in which a distally displaced mandible is present.

William F. Ford

PREVENTIVE PERIODONTIA

B. Tompson, B.D.S. D. J. Australia 23:5-6, May-June, 1951.

The most important factors in the prevention of pyorrhea are oral hygiene, function and avoidance of mechanical irritation. Nutrition has been purposely omitted from this list in

the belief that too little is known of its effect on the periodontal tissues to justify its inclusion. It is, of course, beyond dispute that gross vitamin deficiencies, for example, can seriously affect periodontal health, but gross deficiencies are rare in this country. On the other hand, there is no evidence that moderate or subclinical nutritional deficiencies are largely responsible for pyorrhea.

Teaching oral hygiene is not difficult or tedious with most patients. The opportunity should be taken at this stage to explain, in simple terms, the causal relationship between inadequate hygiene and both caries and pyorrhea. Detailed instruction in methods of cleaning must be given. It is extremely important to use a brush which is not too hard. The so-called "hardness" of a nylon brush depends on the length, diameter and spacing of the individual nylon filaments. The most variable of these features among the present day brushes marketed in Australia is the diameter, which ranges from 0.26 mm. to 0.36 mm. The finest of these gages is just about ideal, since it is quite rigid enough to clean the teeth efficiently, while being flexible enough to permit vigorous use of the brush without danger of injury to either teeth or gums.

Toothbrush massage has been made necessary by the refinement of modern foods. To a certain extent natural function of the teeth can be improved, even under the adverse conditions imposed by present day diet, by a deliberate attempt to chew vigorously. The inclusion in the diet of as much coarse, crisp, and tough fibrous food as possible should also be encouraged. Food should be eaten raw where practicable, or cooked as little as possible.

The third important factor in the prevention of pyorrhea is the avoidance of mechanical irritation. The chief cause of this is subgingival calculus. The teeth must be kept free from this deposit. Another source of mechanical irritation of the gums is the overhanging margin of a dental restoration. Every effort must be made to prevent any surplus filling material from remaining.

TUMORS AND CYSTS OF THE NECK

Arnold S. Jackson. Am. J. Surg. 82:93, July, 1951.

Tumors and cysts of the neck form one of the most interesting diagnostic and surgical problems, one that in many instances offers insurmountable obstacles and yet frequently rewards the surgeon with unexpected and gratifying results. Possibly in no other part of the body do so many distinct pathologic entities occur in so small an area.

A classification of tumors and cysts of the neck is presented. No classification ever has or probably ever will prove satisfactory to those interested in the subject and the author offers this one merely as a working hypothesis. The principal groups in this classification are: tumors of the thyroid and parathyroid glands, tumors of salivary glands, primary tumors of lymph glands, secondary tumors of the neck, benign tumors, unusual tumors, cysts and fistulas and inflammatory lesions. The lesions falling under these headings are discussed briefly as to location, diagnosis and treatment.

Myron Kaufman

JOURNAL OF DENTAL RESEARCH
August 1951

PROCEEDINGS OF THE 29 GENERAL MEETING OF THE INTERNATIONAL ASSOCIATION FOR DENTAL RESEARCH

Compiled by H. B. G. Robinson, p. 455.

GROWTH AND ACID PRODUCTION BY ORAL LACTOBACILLI IN THE PRESENCE OF VARYING AMOUNTS OF REQUIRED VITAMINS

Stewart A. Koser, Barbara Jane Fisher and Shirley L. Kauffman, p. 532.

INFLUENCE OF AMMONIA AND OF UREA UPON L. ACIDOPHILUS 4646. I. STUDIES ON GROWTH

Sholom Pearlman and Thomas J. Hill, p. 542.

The growth of *Lactobacillus acidophilus* 4646 (recently reclassified as *Lactobacillus casei*) was inhibited in nutrient-glucose broth by relatively high concentrations of Na, NH_4, and K phosphates, at pH $>$ 7.0. Certain Na salts were inhibitory at lower pH. The inhibitory effects of Na and NH_4 salts at alkaline pH appeared related to concentration of K salt, and were alleviated by added K. In a defined medium, NH_4 phosphate was inhibitory, but either K or Na (less effective) could relieve the NH_4 inhibition. The inhibitory effects of NH_4 depend upon concentration of

of K, Na, H+, size of inoculum and the composition of the medium. Urea 6 per cent was completely inhibitory for 24 hours; lower concentrations were proportionally less effective. Urea-ammonium phosphate mixtures were not significantly more inhibitory than solutions of each substance when employed alone.

THE USE OF QUATERNARY AMMONIUM COMPOUNDS IN DENTIFRICES

Herbert M. Cobe and Arthur K. Leberknight, p. 558.

Quaternary ammonium compounds have been used as bactericidal and bacteriostatic agents in other fields and their incorporation into dentifrices has been an attempt to combine an antiseptic compound with the usual formulae. The incompatabilities in saliva and in the dentifrices themselves have produced many problems in manufacture, storage and use. Chemical methods of effectiveness are reviewed. Technics followed in this experiment are based on the total and lactobacillus counts. Two hundred students were used as subjects for clinical evaluation and pretest studies were used as controls. All subjects showed a reduction in the total bacteriological count at the end of five minutes. Reductions from the pretest bacterial count were less although obvious at the end of a half hour and at the end of three hours with dentifrices using quaternary compounds, a decided decrease was shown while with the control group using precipitated chalk and a stock paste, definite increases were shown.

DENTINAL PROTEIN: RECOVERY IN PURE FORM

F. L. Losee, R. S. Leopold and W. C. Hess, p. 565.

A technic is described for isolation of maximum percentages of dentinal protein by demineralization. HCl at pH 1.0 is used for 48 hours at room temperatures. Variations in acid concentration have definite effects on protein yields. The protein recovered amounts to 15.5 per cent of the original weight of dentin. This protein is white, contains over 16 per cent nitrogen and leaves less than 0.6 per cent ash on incineration. Of the total amount of nitrogen in the original sample of dentin, from 97 per cent to 99 per cent has been accounted for in solutions and solid material recovered from demineralization.

EXPERIMENTAL STUDIES ON THE DEVELOPMENT OF THE MANDIBULAR ARCH IN AMBLYSTOMA PUNCTATUM

Barnet M. Levy and Samuel R. Detwiler, p. 575.

All experiments were performed on embryos of *Amblystoma punctatum* in the early tail bud stages. The unilateral rotation of the mandibular arch through 180 degrees (reversal of both A-P and D-V axes) resulted in a distortion of the arch. Whereas all of the elements normally found in the region were present, their topographic arrangement was disturbed. Healing in this region was also abnormal. Reversing the A-P axis only did not result in such severe abnormalities.

When the mandibular arch was transplanted to the anterior somite area, its development varied considerably. If the oral epithelium was included in the graft, teeth developed. The donor embryo, however, did not regenerate a new mandibular arch.

When incisions were made in the midline and posterior margins of the mandibular arch, gross abnormalities developed in a large percentage of the embryos. However, healing occurred normally in almost all cases when incisions were along the other margins of the mandibular arch.

The results of all of these experiments show that the mandibular arch does not possess the power of complete restitution.

THE ORIGIN AND DISTRIBUTION OF THE LABIAL AND BUCCAL GLANDS IN THE HUMAN FETUS

Arnold A. Zimmermann and Samuel Zeidenstein, p. 587.

The accessory salivary glands develop early in the third fetal month, after the primordia of the major salivary glands are well established. The time and mode of development as well as the pattern of distribution of the labial, buccal and retromolar glands were established by serial sections of fetal heads of the third to the fifth month. The finer histodifferentiation occurs throughout the remainder of fetal life.

PROCEEDINGS OF THE NEW YORK SECTION, INTERNATIONAL ASSOCIATION FOR DENTAL RESEARCH

Compiled by Frances Krasnow, p. 599.

MALOCCLUSION RESULTING FROM A RETAINED DECIDUOUS TOOTH: REPORT OF A CASE

By Arthur M. Schorr, D.M.D., New York.

Orthodontic problems often arise from premature loss of deciduous teeth, but few instances of malocclusion caused by retention have been reported.

The following is a report of a case in which malocclusion was the result of prolonged retention of a lower right deciduous cuspid, which served as an unnecessary space maintainer between the permanent cuspid and first bicuspid. Although corrective treatment was successful, time and expense could have been saved if the tooth had been removed earlier.

A young man, 19 years of age, reported for complete dental examination on December 31, 1948. Routine roentgenograms were taken and study models were prepared. Clinical examination revealed a *DMF* rate (decayed, missing and filled tooth ratio) of 10. No teeth were missing, but all four third molars were unerupted. The lower right deciduous cuspid was present (Fig. 1), but it was only partially embedded in alveolar bone since most of the root had been resorbed. It was mobile but free of decay. A diastema, 2.5 mm. in width, was noted between the upper central incisors (Fig. 2A) and the patient requested its correction. Occlusion on the right side of the mouth was irregular (Fig. 2B) as a result of the posterior position of the first and second permanent bicuspids and the first and second permanent molars in the lower jaw on that side. As can be seen in Figure 2A, a shifting commenced from the midline of the maxillary arch and proceeded posteriorly in the upper right quadrant, resulting in the unesthetic space between the upper central incisors.

Treatment • A complete scaling and prophylaxis was done on January 12, 1949. Following this the patient again received a thorough examination and, on the next visit, restorative work was begun. It was decided to extract the lower right deciduous cuspid following the restorative treatment, but this was not accomplished until June 21 because of the patient's absence from town.

Fig. 1 • Lower right deciduous cuspid. Note root resorption

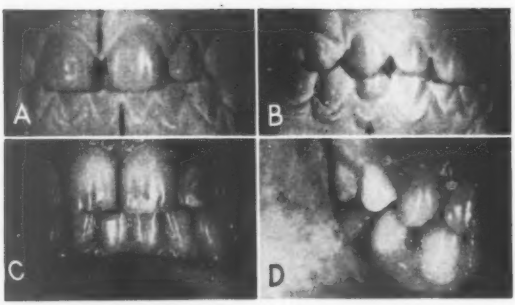


Fig. 2 • A: Model showing diastema between upper permanent central incisors and the shift in the maxillary midline. B: Model showing malocclusion in right anterior area. C and D: Improved occlusion after treatment

The patient was then referred to another office (S. J. Mink of New York), where orthodontic treatment was begun on September 14. The treatment was concluded successfully from an esthetic as well as a functional standpoint (Fig. 2,C and D) on April 22, 1950.

Conclusion • Knowledge of the eruption times of permanent teeth, as well as an understanding of the growth period of the maxilla and mandible, should be coordinated with a careful roentgenologic and oral examination in the case of young persons in whom the deciduous teeth are being shed and the permanent dentition is erupting. In the case described, extraction of the lower right deciduous cuspid, at the time of eruption of its permanent successor would most probably have obviated the necessity for orthodontic treatment at a later age and thus saved the patient much inconvenience and expense.

315 West End Avenue

NEAR EXSANGUINATION FROM PERIODONTAL DISEASE: REPORT OF A CASE

By S. O. Tatkin, D.D.S., M.D., Grandview, Washington

Minor hemorrhages are commonly seen in cases of gingivitis. Bleeding from the gums sufficient to cause the hemoglobin to fall to a level of shock is infrequently observed.

A twenty year old white patient received prenatal supervision in our clinic. The pregnancy culminated in an uneventful hospital delivery. She was gravida I, para O. On discharge from the hospital following delivery, the hemoglobin level was 70 per cent with a red blood cell count of 4,640,000. In the course of her prenatal examinations, it was noticed that she had a severe case of periodontal disease. Large accumulations of calculus were present and the patient was referred to her dentist for necessary treatment. The dentist decided against any interference until after the delivery. There was a small amount of bleeding from the gums during the entire prenatal period. The condition of the gums did not resemble that of a true pregnancy gingivitis with its typical hyperplasia.

A week after delivery, the patient was readmitted to the hospital because of severe bleeding from the mouth and faintness. Examination showed her to be in a state of shock with a rapid, thready pulse. The mouth was full of blood clots. When these coagula were cleared away, a stream of blood could be seen spurting from the interproximal tissue between the left maxillary lateral incisor and cuspid. One-half centimeter of epinephrine (1:1,000) was injected into the mucosa in this area down to the periosteum. This procedure was effective although prior attempts to stop the hemorrhage with pressure had been of no avail. In the event of failure to arrest the hemorrhage with epinephrine, removal of the teeth in the region of the ruptured vessel, and suturing, had been planned. The various cellulose hemostatic agents would have been ineffective in this instance, since the hemorrhage was from the interdental papilla and no room was available for packing with these products. The rate of hemorrhage left little doubt in our minds that the patient would bleed to death if it were not stopped.

The severity of the hemorrhage was reflected in the fact that the hemoglobin level fell to less than 40 per cent and the red blood cell count was reduced to a level of 2,800,000. The patient was given four pints of blood and the hemoglobin level was raised within the next two days to 89 per cent.

The patient was subsequently referred to her dentist, who removed all teeth and performed an alveolectomy, in several sittings. No hemorrhage or other postoperative complications followed.

DENTIA PRAECOX IN A PREMATURE INFANT: REPORT OF A CASE

By Rudolph M. Lord, D.D.S., Little Rock, Ark.

This is a report of an unusual case in which a premature infant, apparently born with two lower central incisors, lost them both four weeks after birth, or a month before the date he would have been born if he had been a full-term baby.

The infant, the first child of a 22 year old mother, was born on April 19, 1946, two months before term. He was kept in an incubator until May 11, when he was removed to a bassinet. On that day, the lower right central incisor was discovered in the bassinet. The infant was being fed with an eyedropper and, on finding that the lower left central incisor was loose, the pediatrician requested its extraction in order to avoid an accidental respiratory obstruction.

The extraction was performed. No roots were present on either of the teeth.

The mother was in normal good health, but her medical history showed she had had a calcium deficiency during the early months of pregnancy.

1214 Donaghey Building

CLOSURE OF ANTRAL ORAL FISTULA: REPORT OF A CASE

By Cmdr. Charles R. Shea (DC), U.S.N., Washington, D. C.

The patient, a 42 year old man, was admitted to the hospital with a fistula of the upper left first molar area. Three months previously, the maxillary first molar had been removed and a postoperative infection had developed. When the infection was controlled, a fistula was found between the antrum and the oral cavity. Closure was unsuccessfully attempted several times.

Clinical Examination • The patient's oral condition was normal except for a fistula between the left maxillary first molar area and the antrum. The area was found to be about 5 mm. in diameter. The pocket was filled with necrotic tissue.

Roentgenographic Examination • Roentgenograms were taken of the maxillary sinuses and the periapical areas of the molars in order to determine if fragments or root tips were present within the maxillary sinuses. The roentgenographic report was essentially negative. The left maxillary sinus was slightly opaque; this finding was attributable to the chronic irritation of the antrum.

Treatment • The antrum was irrigated with normal physiologic saline solution, and irrigation was continued until the washings were clear. The patient was then referred to the rhinologist, who constructed an internasal window. At the end of the week the patient was returned to the dental department for further treatment.

Operation • Because of the history of chronic infection, the patient was given 30,000 units of penicillin at three-hour intervals. Morphine and atropine were administered as premedication. Under local anesthesia the maxillary left first molar area was incised and the necrotic tissue removed. The bony lining of the socket was cleaned and the buccal flap was lifted and relieved. A palatal incision was then made anterior to the bicuspid and posterior to the distal surface of the second molar. The flap was completely lifted from the palate, and a small piece of cartilage, which had been obtained from a submucosal resection and treated by the laboratory, was fitted over the opening into the antrum. A small hole was made on the buccal and lingual surfaces of the opening and through each side of the cartilage. A piece of catgut suture was threaded in through the cavity holes and out through the cartilage, which was sutured in place over the antral opening. The pedicle flap, which had previously been constructed, was moved over to the buccal surface and sutured into place. Administration of penicillin was continued and the patient was advised not to blow his nose.

Course • The following day the patient's temperature was normal and he was comfortable. The flap appeared healthy and in good position. At the end of six days the sutures were removed and the patient was discharged from the hospital. Three weeks later, when the patient returned for observation, the fistula was found to be completely closed.

Naval Gun Factory

The opinions or assertions contained in this article are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

Deaths

Ableiter, Emil A., Nashua, Iowa; Chicago College of Dental Surgery, Loyola University, 1899; died August 11; aged 74.

Ames, James W., Evansville, Wis.; Chicago College of Dental Surgery, Loyola University, 1901; died October 11; aged 77.

Amos, Alvin C., Pittsburgh; Pittsburgh Dental College, Western University of Pennsylvania, 1907; died October 28; aged 80.

Arnold, Thomas H., Cincinnati; Ohio College of Dental Surgery, University of Cincinnati, 1913; died September 1; aged 72.

Averell, George W., Oceanside, N. Y.; School of Dentistry, University of Buffalo, 1898; died September 20.

Bachelder, Eugene E., Hallowell, Maine; Dental School, Tufts College, 1914; died September 26; aged 62.

Barefield, William S., Chattanooga, Tenn.; Atlanta Dental College, 1906; died September 17; aged 73.

Barry, Walter F., Jr., Madison, N. J.; School of Dentistry, University of Pennsylvania, 1934; died August 25; aged 41.

Baxter, Henry E., Austin, Texas; Kansas City Dental College, 1891; died October 13; aged 84.

Beach, Irvin H., Glen Rock, N. J.; School of Dentistry, University of Pennsylvania, 1909; died September 11; aged 72.

Beach, Paul M., Champaign, Ill.; Illinois School of Dentistry, Chicago, 1900; died September 22; aged 73.

Becker, Arthur A., Buffalo; School of Dentistry, University of Buffalo, 1915; died August 19.

Bennett, Robert J., Rochester, N. Y.; School of Dentistry, University of Buffalo, 1919; died September 18; aged 54.

Birdsong, James S., Pineville, La.; Pennsylvania College of Dental Surgery, Philadelphia, 1890; died October 6; aged 85.

Bleier, Millard J., New York; College of Dentistry, New York University, 1930; died September 3; aged 46.

Boyles, Ruby C., Goodlettsville, Tenn.; School of Dentistry, Vanderbilt University, 1913; died February 6; aged 64.

Bradley, Joseph J., Staten Island, N. Y.; Dental School, Northwestern University, 1949; died September 12; aged 32.

Breaks, Ernest E., Crawfordsville, Ind.; Chicago College of Dental Surgery, Loyola University, 1909; died September 21; aged 68.

Brimacombe, William T., Sapulpa, Okla.; Indiana Dental College, 1902; died August 24; aged 74.

Bringhurst, Mark D., Salt Lake City; Chicago College of Dental Surgery, Loyola University, 1918; died September 14; aged 57.

Brooks, James M., Pineville, Ky.; School of Dentistry, University of Louisville, 1921; died September 21; aged 57.

Brown, Max E., Red Oak, Iowa; College of Dentistry, University of Iowa, 1915; died September 4; aged 61.

Buff, Arthur J., Topeka, Kan.; Dental College, Kansas City, 1915; died August 18; aged 58.

Bullard, Thomas P., Roseboro, N. C.; Dental School, Northwestern University, 1909; died April 7; aged 65.

Campbell, Edwin J., Chicago; Chicago College of Dental Surgery, Loyola University, 1900; died September 14; aged 80.

Candy, William R., Philadelphia; School of Dentistry, Temple University, 1932; died September 6; aged 50.

Chessrown, James H., Youngstown, Ohio; Pittsburgh Dental College, Western University of Pennsylvania, 1901; died September 8; aged 72.

Chevigny, Henry H., Onset, Mass.; Boston Dental College, 1895; died August 25; aged 90.

Christensen, Atlantic, Salt Lake City; School of Dentistry, University of Denver, 1902; died September 29; aged 83.

Christian, Wilson Y., Ocean City, N. J.; School of Dentistry, University of Pennsylvania, 1915; died September 27; aged 60.

Clasing, John F. W., Brooklyn; College of Dentistry, New York University, 1888; died in September; aged 85.

Collar, Floyd J., Oakland, Calif.; College of Dentistry, University of California, San Francisco, 1909; died October 28; aged 71.

Condit, Harold S., Chicago; College of Dentistry, University of Illinois, 1916; died in September; aged 58.

Cortese, Anthony, El Paso, Texas; Texas Dental College, Houston, 1930; died February 28; aged 53.

Crowell, Irving G., Shell Lake, Wis.; College of Dentistry, University of Iowa, 1903; died August 19; aged 73.

Dancy, Charles C., Norristown, Pa.; School of Dentistry, University of Pennsylvania, 1900; died August 26; aged 72.

Darling, George L., Lowell, Mass.; Medico Chirurgical College of Philadelphia, 1911; died October 18; aged 65.

Devine, John A., Cheyenne, Wyo.; College of Dentistry, Creighton University, 1909; died September 2; aged 65.

Dort, Wilson C., Boston; Dental School, Harvard University, 1901; died August 25; aged 71.

Dunn, Frank A., Cleveland; School of Dentistry, Western Reserve University, 1903; died April 27; aged 73.

Eernisse, Peter A., Hot Springs, S. D.; College of Dentistry, University of Iowa, 1909; died August 15; aged 70.

Eiber, Arthur W., Cleveland; School of Dentistry, Western Reserve University, 1916; died September 17; aged 56.

Federspiel, Matthew N., Milwaukee; Dental School, Marquette University, 1900; died September 6; aged 71.

Feinman, Max, Middle Village, N. Y.; College of Dentistry, New York University, 1920; died June 21; aged 57.

Finnegan, Bernard T., Madison, Wis.; died August 27.

Franz, Maurice P., Wichita, Kan.; Western Dental College, Kansas City, 1934; died September 14; aged 42.

Friedman, Joseph A., St. Louis; School of Dentistry, St. Louis University, 1926; died September 4; aged 55.

Furgatch, Henry D., New York; College of Dental and Oral Surgery, New York, 1921; died October 11.

Gallagher, George J., San Francisco; College of Physicians and Surgeons, San Francisco, 1922; died May 17.

Gasaway, James N., Lexington, Mich.; Kansas City-Western Dental College, 1924; died October 25; aged 55.

Gedeon, John G., Cleveland; School of Dentistry, Western Reserve University, 1923; died October 2; aged 55.

Gette, Frank H., Philipsburg, Pa.; School of Dentistry, University of Pennsylvania, 1919; died September 30; aged 53.

Gladstone, James H., Margaretville, N. Y.; died September 6.

Gleason, Harry C., Pacific Grove, Calif.; College of Dentistry, University of Southern California, 1900; died October 20; aged 82.

Glick, Reuben, Brooklyn; College of Dentistry, New York University, 1924; died September 22; aged 50.

Greenberg, Samuel, Chicago; Chicago College of Dental Surgery, Loyola University, 1924; died September 26; aged 54.

Greene, Turner E., Greenville, Ala.; School of Dentistry, Vanderbilt University, 1894; died October 19; aged 79.

Greminger, Albert N., South Salem, N. Y.; College of Dentistry, New York University, 1902; died August 23; aged 71.

Guildford, Alfred E., Torrington, Conn.; Dental Department, Baltimore Medical College, 1913; died October 21; aged 62.

Guse, Albert W., Bryant, S. D.; Chicago College of Dental Surgery, Loyola University, 1915; died October 5; aged 60.

Handler, Alfred A., Brooklyn; School of Dentistry, University of Pittsburgh, 1944; died September 15; aged 29.

Hartman, Leroy L., New York; Dental School, Northwestern University, 1913; died November 3; aged 58.

Hert, Clifton H., Philadelphia; School of Dentistry, University of Pennsylvania, 1923; died August 30; aged 56.

Hess, Harry H., Falls City, Neb.; College of Dentistry, Creighton University, 1915; died August 24.

Hill, Charles E., Los Angeles; died September 12.

Hill, H. Hansford, Charleston, W. Va.; died September 17; aged 47.

Holdoway, Harold C., Eldorado, Ill.; School of Dentistry, Washington University, St. Louis, 1923; died July 17.

Hollingsworth, William G., Sheboygan, Wis.; Dental School, Northwestern University, 1900; died July 6; aged 77.

Hufham, Henry P., Eufaula, Ala.; School of Dentistry, Tulane University, 1925; died September 3; aged 55.

Humphreys, Alva O., Indianapolis; School of Dentistry, Indiana University, 1926; died September 3.

Huson, Franklin M., Huntington, W. Va.; Department of Dental Surgery, Wisconsin College of Physicians and Surgeons, Milwaukee, 1904; died August 29; aged 71.

Hutchinson, Harley T., Loveland, Ohio; Ohio College of Dental Surgery, University of Cincinnati, 1925; died September 23; aged 51.

Hutchison, Alexander J., Hudson, N. Y., School of Dentistry, University of Pennsylvania, 1923; died October 4; aged 50.

Irick, Hector T., Vincentown, N. J.; Pennsylvania College of Dental Surgery, Philadelphia, 1908; died November 5; aged 68.

Jackson, DeQuilla Q., San Francisco; College of Dentistry, University of California, 1919; died September 7.

Jenkins, Ralph P., Jr., Bellevue, Wash.; College of Dentistry, University of Minnesota, 1940; died September 3; aged 35.

Jewett, William F., Minneapolis; College of Dentistry, University of Minnesota, 1893; died November 23; aged 84.

Johnson, Edwin W., Seattle; Dental School, Marquette University, 1923; died May 1; aged 51.

Johnson, Harrison C., Detroit; School of Dentistry, University of Detroit, 1943; died October 15; aged 33.

Johnson, Harry L., Rockford, Ill.; Chicago College of Dental Surgery, Loyola University, 1929; died August 29.

Johnson, Oscar T., Morris, Minn.; College of Dentistry, University of Minnesota, 1914; died August 29; aged 61.

Jones, Harold F., Buffalo; School of Dentistry, University of Buffalo, 1905; died September 13.

Karp, Alfred, Union City, N. J.; School of Dental and Oral Surgery, Columbia University, 1943; died November 14; aged 33.

Keith, Cassius C., Hastings, Neb.; Dental School, Northwestern University, 1904; died August 7.

Kelley, Thomas D., Jr., Lexington, Ky.; Baltimore College of Dental Surgery, University of Maryland, 1899; died August 17.

Kieser, Clifford V., McAlester, Okla.; Kansas City Dental College, 1911; died August 19; aged 60.

Kirmayer, Thomas D., Cliffside Park, N. J.; Dental School, Harvard University, 1932; died September 12; aged 46.

Kirts, W. Merril, Hampshire, Ill.; Dental School, Northwestern University, 1934; died September 30; aged 47.

Kizer, R. Gordon, Lake Ariel, Pa.; School of Dentistry, Temple University, 1928; died September 3; aged 56.

Knight, John G., Honolulu, T. H.; College of Dentistry, University of Southern California, 1921; died November 19; aged 53.

Korenstein, Abraham L., Hoboken, N. J.; School of Dentistry, University of Pennsylvania, 1922; died November 14; aged 53.

Krause, Lee Roy J., North Platte, Neb.; College of Dentistry, Creighton University, 1915; died September 25; aged 56.

Kulka, Bruno P., New York; University of Vienna, 1906; died March 21; aged 71.

Larsen, James A., Chicago; College of Dentistry, University of Illinois, 1908; died November 27; aged 69.

Lawrence, William H., Bryan, Texas; died May 14.

Lief, Jacob F., Rockaway Park, N. Y.; College of Dentistry, New York University, 1903; died October 14; aged 73.

Lindsay, Roscoe T., San Bernardino, Calif.; School of Dentistry, Washington University, St. Louis, 1908; died September 20; aged 69.

Llewellyn, Clarence D., Chattanooga, Tenn.; College of Dentistry, Baylor University, 1940; died October 13; aged 37.

Locker, Frank, Brooklyn; New York College of Dentistry, 1918; died May 19; aged 58.

Long, Edwin L., Miami Shores, Fla.; Chicago College of Dental Surgery, Loyola University, 1905; died November 11; aged 73.

Long, George D., Rochester, N. Y.; School of Dentistry, University of Buffalo, 1921; died October 2; aged 54.

Loop, Jack L., Alhambra, Calif.; College of Dentistry, University of Southern California, 1925; died October 21; aged 53.

Lowry, Ralph J., Kansas City, Mo.; Kansas City—Western Dental College, 1923; died August 5.

Lubahn, William F., Jr., Mount Clemens, Mich.; Dental School, Northwestern University, 1932; died August 18; aged 45.

Lucco, Carmen A., Cleveland; School of Dentistry, University of Pittsburgh, 1928; died August 28; aged 51.

Lusk, Myron E., Minneapolis; College of Dentistry, University of Minnesota, 1926; died November 25; aged 49.

Lynde, Frank M., Richford, Vt.; Dental School, Harvard University, 1898; died November 16; aged 80.

Mabee, James R., Paterson, N. J.; Baltimore College of Dental Surgery, University of Maryland, 1907; died October 27; aged 68.

Mace, Wallace, Salt Lake City; Kansas City Dental College; 1912; died October 3; aged 62.

MacKenzie, John F., Detroit; Department of Dental Surgery, Detroit College of Medicine, 1895; died August 6; aged 82.

Maier, Raymond E., Evansville, Ind.; School of Dentistry, St. Louis University, 1946; died October 3; aged 31.

Mallett, George E., Denver; School of Dentistry, University of Denver, 1918; died September 16; aged 55.

Mallory, H. Rawls, Savannah, Ga.; Atlanta—Southern Dental College, 1913; died September 2.

Malmstrom, Nels H., Belmont, Mass.; Dental School, Harvard University, 1910; died September 18; aged 62.

Mann, Samuel, New York; died July 18.

Manning John A., Chicago; Chicago College of Dental Surgery, Loyola University, 1905; died June 30; aged 72.

Manus, Moses L., Chicago; Chicago College of Dental Surgery, Loyola University, 1925; died October 20; aged 56.

Martin, Albert A., Sturgeon Bay, Wis.; Dental School, Marquette University, 1918; died September 28; aged 54.

Martin, James H., Worcester, Mass.; Dental School, Tufts College, 1919; died October 4.

Mathers, Edgar R., Lincoln, Neb.; Western Dental College, Kansas City, 1899; died August 30; aged 88.

Mieger, Ernest H., Oakland, Calif.; College of Physicians and Surgeons, San Francisco, 1928; died October 3; aged 49.

Moore, Edward H., Pittsburgh; School of Dentistry, University of Pennsylvania, 1896; died October 4; aged 76.

Moore, William S., College Park, Md.; Baltimore College of Dental Surgery, University of Maryland, 1921; died August 31; aged 68.

Morris, William A., Brooklyn; College of Dentistry, New York, 1898; died October 15; aged 74.

Mullen, Charles W., Leavenworth, Kan.; Western Dental College, Kansas City, 1916; died October 12; aged 66.

Nerbas, H. R., Eugene, Ore.; died September 4.

Newell, Albert B., Monongahela, Pa.; School of Dentistry, University of Pittsburgh, 1916; died September 17.

Norris, Clarence E., Linneus, Mo.; School of Dentistry, St. Louis University, 1919; died April 19; aged 62.

Norris, William H., Wilmington, Del.; Pennsylvania College of Dental Surgery, Philadelphia, 1898; died September 3; aged 75.

Pearce, Arthur J., Chicago; Chicago College of Dental Surgery, Loyola University, 1908; died November 3; aged 66.

Peate, Leslie W., Klamath Falls, Ore.; School of Dentistry, North Pacific College of Oregon, 1923; died September 16; aged 57.

Penney, Guy A., Minneapolis; Missouri Dental College, St. Louis, 1894; died April 21; aged 77.

Petersen, Soren L., Portland Ore.; School of Dentistry, North Pacific College of Oregon, 1916; died September 19.

Phillips, George, Santa Monica, Calif.; College of Dentistry, University of Southern California, 1946; died April 23; aged 27.

Pinney, Harry B., Oak Park, Ill.; Chicago College of Dental Surgery, Loyola University, 1900; died October 18; aged 76.

Porter, Charles H., Branford, Conn.; died August 31; aged 80.

Price, George W., Kinston, N. C.; Atlanta-Southern Dental College, 1933; died February 16; aged 42.

Putney, William H., Concord, N. H.; Dental School, Tufts College, 1924; died September 9; aged 61.

Pye, Thomas W., San Francisco; College of Dentistry, University of California, 1929; died August 31; aged 50.

Reber, Gottlieb M., St. Joseph, Mo.; Western Dental College, Kansas City, 1921; died August 21; aged 75.

Reed, Mossman G., Pawtucket, R. I.; Dental School, Tufts College, 1916; died August 25; aged 61.

Richards, Paul E., Chamblee, Ga.; School of Dentistry, Indiana University, 1921; died in September.

Richardson, Wade F., Brandenburg, Ky.; School of Dentistry, Indiana University, 1930; died August 17; aged 62.

Richer, Jesse M., South Whitley, Ind.; Indiana Dental College, 1905; died October 9.

Roberts, Edward J., Jersey City; Baltimore College of Dental Surgery, University of Maryland, 1920; died September 22; aged 72.

Roberts, John K., Williamstown, W. Va.; Dental Department, University College of Medicine, Richmond, 1899; died September 11; aged 80.

Roberts, Roy G., Wichita Falls, Texas; College of Dentistry, Baylor University, 1925; died October 5; aged 54.

Rodlun, Clifford N., Washington, D. C.; College of Dentistry, University of Minnesota, 1924; died October 4; aged 50.

Romig, Henry G., Springfield, Mo.; College of Dentistry, Creighton University, 1908; died August 21.

Rosenbaum, William, New York; College of Dentistry, New York University, 1901; died September 16; aged 69.

Rosenblum, Benjamin W., Bronx, N. Y.; College of Dentistry, New York University, 1936; died October 2; aged 41.

Rutland, Joseph R., Montgomery, Ala.; Atlanta-Southern Dental College, 1918; died September 12; aged 58.

Rutter, Leslie F., Mount Clemens, Mich.; School of Dentistry, University of Michigan, 1901; died August 26; aged 71.

Sandiford, Chester L., Boston; Dental School, Harvard University, 1916; died August 24; aged 58.

Scadding, Frederick G., Cleveland; died September 13.

Schaefer, Ezra E., Jr., Denver; Dental School, Northwestern University, 1944; died August 17; aged 31.

Schlaefer, Urvin F., Oshkosh, Wis.; Dental Department, Milwaukee Medical College, 1900; died August 25; aged 75.

Schout, William P., Allentown, Pa.; School of Dentistry, University of Pennsylvania, 1924; died August 20; aged 54.

Seip, Albert F., Long Beach, Calif.; Medico Chirurgical College of Philadelphia, 1903; died March 27.

Shoaff, Walter R., Los Angeles; died August 29.

Sloan, Troy P., Lebanon Junction, Ky.; Louisville College of Dentistry of Centre College, 1916; died October 16; aged 55.

Smith, T. Sydney, San Francisco; School of Dentistry, University of Buffalo, 1901; died October 9; aged 85.

Spence, Thomas, Crookston, Minn.; College of Dentistry, University of Minnesota, 1897; died September 29; aged 79.

Stack, Fanny M., Chicago; died September 17.

Stanley, William R., Yakima, Wash.; Dental School, Northwestern University, 1902; died September 18; aged 75.

Steen, Harry W., Cincinnati; Ohio College of Dental Surgery, University of Cincinnati, 1900; died August 25.

Stele, Joseph H., Fairview, N. J.; School of Dentistry, Temple University, 1932; died August 18; aged 43.

Stimmel, Edward C., Pueblo, Colo.; College of Dentistry, University of Iowa, 1902; died April 24.

Sugahiro, Tetsuo Toyson, Ontario, Ore.; School of Dentistry, North Pacific College of Oregon, 1933; died September 8; aged 46.

Swanbom, Leonard J., Scottsbluff, Neb.; College of Dentistry, University of Nebraska, 1924; died September 2; aged 56.

Teitgen, Florence E., Seattle; Dental School, Northwestern University, 1904; died October 9; aged 56.

Teller, David D., Brooklyn; New York College of Dentistry, 1913; died May 4; aged 61.

Terry, J. Dean, Seattle; College of Dental Surgery, University of Michigan, 1905; died September 14; aged 68.

Tifft, Wallace L., Glencoe, Minn.; College of Dentistry, University of Minnesota, 1896; died June 19; aged 78.

Tobin, Edward W., Boston; Dental School, Tufts College, 1903; died October 6; aged 70.

Totten, William J., Watertown, Mass.; died September 12; aged 63.

Tourtellot, Louis J., Enid, Okla.; College of Dentistry, University of Iowa, 1901; died August 6; aged 75.

Ury, Anschil B., Chicago; Western Dental College, Kansas City, 1924; died June 22.

Van Ornum, Perley T., Racine, Wis.; College of Dental Surgery, University of Michigan, 1895; died October 26; aged 81.

VanValey, Edwin G., New York; School of Dentistry, University of Pennsylvania, 1919; died September 1; aged 57.

Varon, Charles, Brooklyn; School of Dentistry, University of Buffalo, 1927; died June 14; aged 52.

Vogel, Thomas A., San Francisco; College of Dentistry, University of California, 1894; died September 16.

Vogelpohl, Edwin F., Nashville, Tenn.; School of Dentistry, Vanderbilt University, 1919; died July 14; aged 58.

Wallace, Colman L., Yazoo City, Miss.; College of Dentistry, University of Tennessee, 1925; died October 3; aged 59.

Warashina, Heijiro, Spokane, Wash.; School of Dentistry, North Pacific College of Oregon, 1928; died June 15; aged 52.

Watkins, Charles D., Leavenworth, Kan.; School of Dentistry, University of Louisville, 1902; died June 24; aged 73.

Weitzman, Samuel, Brooklyn; College of Dental and Oral Surgery, New York, 1917; died November 1; aged 56.

Welker, George V., Williamsport, Pa.; Baltimore College of Dental Surgery, 1901; died August 23; aged 76.

Wescher, Karl R., Dayton, Ohio; Ohio College of Dental Surgery, University of Cincinnati, 1926; died September 29; aged 53.

West, Barzillia R., Jr., Philadelphia; Philadelphia Dental College, 1903; died in May; aged 76.

Wilhelmi, Joseph E., Oak Park, Ill.; Dental School, Marquette University, 1923; died September 21; aged 54.

Williamson, Joseph T., East Liverpool, Ohio; Department of Dentistry, Starling-Ohio Medical College, 1908; died October 9; aged 75.

Wood, Frank C., Los Angeles; College of Dentistry, University of Southern California, 1925; died September 20; aged 55.

Wood, Robert L., Monroe, La.; Atlanta-Southern Dental College, 1918; died September 11; aged 59.

Woods, Carter R., Rutland, Vt.; Dental Department, Meharry Medical College, Nashville, 1921; died September 4; aged 71.

Woolley, Kenneth C., Portland, Ore.; School of Dentistry, North Pacific College of Oregon, 1923; died July 22; aged 54.

Wright, Frank L., Wheeling, W. Va.; Pennsylvania College of Dental Surgery, Philadelphia, 1887; died September 21; aged 83.

Wyatt, C. Earl, Independence, Kan.; Kansas City Dental College, 1917; died July 10; aged 75.

Yamagata, Susumu, Honolulu, T. H.; College of Dentistry, University of Southern California, 1936; died October 26; aged 42.

Yates, Eugene P., Greenwood, Miss.; School of Dentistry, Tulane University, 1922; died September 10; aged 53.

Directory

OFFICERS

LeRoy M. Ennis, President.....4001 Spruce St., Philadelphia
Otto W. Brandhorst, President-Elect .....4952 Maryland Ave., St. Louis
David J. Fitzgibbon, First Vice-President .....601 19th St., N.W., Washington, D.C.
Perley M. Cunningham, Second Vice-President.....510 Hynds Bldg., Cheyenne, Wyo.
Oscar P. Snyder, Third Vice-President. .Walter Reed Army Medical Center, Washington, D.C.
Ernest G. Sloman, Speaker, House of Delegates.....344 14th Street, San Francisco
Harold Hillenbrand, Secretary .....222 E. Superior St., Chicago
C. Willard Camalier, Assistant Secretary.....1726 Eye St., N.W., Washington, D.C.
Louis M. Cruttenden, Assistant Secretary.....222 E. Superior St., Chicago
H. B. Washburn, Treasurer.....Lowry Medical Arts Bldg., St. Paul
Lon W. Morrey, Editor.....222 E. Superior St., Chicago

BOARD OF TRUSTEES

William R. Alstadt, 1954, Twelfth District.....610 Boyle Bldg., Little Rock, Ark.
Bernerd C. Kingsbury, 1954, Thirteenth District.....490 Post St., San Francisco
Percy T. Phillips, 1954, Second District.....18 E. 48th St., New York
Clarence S. Renouard, 1954, Eleventh District.....304 Phoenix Bldg., Butte, Mont.
W. Earle Craig, 1953, Third District.....8113 Jenkins Arcade, Pittsburgh
L. H. Jacob, 1953, Eighth District.....Jefferson Bldg., Peoria, Ill.
James E. John, 1953, Fifth District.....Medical Arts Bldg., Roanoke, Va.
Daniel F. Lynch, 1953, Fourth District.....1687 Primrose Road, N.W., Washington, D.C.
Obed H. Moen, 1953, Ninth District.....Watertown, Wis.
J. B. Carr, 1952, Seventh District.....Hume Mansur Bldg., Indianapolis
C. S. Foster, 1952, Tenth District.....Dows Bldg., Cedar Rapids, Iowa
Charles I. Taggart, 1952, First District.....139 Bank St., Burlington, Vt.
Robert P. Thomas, 1952, Sixth District.....Francis Bldg., Louisville, Ky.

BUREAUS

Economic Research and Statistics: B. D. Moen, Director, 222 E. Superior St., Chicago
Library and Indexing Service: Donald A. Washburn, Director, 222 E. Superior St., Chicago
Public Information: Herbert B. Bain, Director, 222 E. Superior St., Chicago

COUNCILS

Constitution and Bylaws: Max E. Ernst, Chm., Lowry Medical Arts Bldg., St. Paul
Dental Education: E. R. Westcott, Chm., The Mayfair, Albany and Atlantic Aves., Atlantic City, N.J.
Shailer Peterson, Secy., 222 E. Superior St., Chicago

Dental Health: David W. Brock, Chm., 6026 Enright Ave., St. Louis 12
Allen O. Gruebbel, Secy., 222 E. Superior St., Chicago

Dental Museum and Registry: Henry A. Swanson, Chm., 1726 Eye St., N.W., Washington, D.C.

Dental Research: J. L. T. Appleton, Chm., 4001 Spruce St., Philadelphia

Dental Therapeutics: Thomas J. Hill, Chm., 2085 Adelbert Road, Cleveland
J. Roy Doty, Secy., 222 E. Superior St., Chicago

Dental Trade and Laboratory Relations: F. W. Herbine, Chm., 230 N. Fifth St., Reading, Pa.

Federal Dental Services: R. H. Friedrich, Chm., 960 Park Ave., Plainfield, N.J.

Hospital Dental Service: Frank B. Hower, Chm., 814 Heyburn Bldg., Louisville, Ky.

Insurance: Paul W. Zillmann, Chm., 29 Walden Ave., Buffalo

International Relations: D. J. Aubertine, Chm., 760 Market St., San Francisco

Journalism: Charles A. Wilkie, Chm., 1 Hanson Place, Brooklyn

Judicial Council: H. B. McCarthy, Chm., 5821 Bellona Ave., Baltimore

Legislation: E. Harold Gale, Chm., 142 Washington Ave., Albany, N.Y.
Francis J. Garvey, Secy., 222 E. Superior St., Chicago

Membership: H. C. Jarvis, Chm., Mercantile Library Bldg., Cincinnati

National Board of Dental Examiners: Robert J. Wells, Chm., 1525 E. 53rd St., Chicago
Shailer Peterson, Secy., 222 E. Superior St., Chicago

Relief: Leo W. Kremer, Chm., 55 E. Washington St., Chicago

Scientific Session: William A. Garrett, Chm., Candler Bldg., Atlanta, Ga.

SECTION CHAIRMEN

Operative Dentistry: Morton H. Mortonson, Jr., 735 N. Water St., Milwaukee

Oral Surgery and Anesthesia: H. Newman Brownson, 7046 Hollywood Blvd., Hollywood, Calif.

Orthodontics and Oral Development: William R. Joule, 549 High St., Newark, N.J.

Pedodontics: William A. Jordan, Minnesota Dept. of Health, University Campus, Minneapolis

Periodontics: Walter Leabo, 706 Medical Arts Bldg., Shreveport, La.

Practice Management: Charles H. Kendall, 2866 N. Oakland Ave., Milwaukee

Prosthodontics, Full Dentures: Theodore A. Bodine, 904 Akron Savings and Loan Bldg., Akron, Ohio

Prosthodontics, Partial Dentures: Alfred C. Young, 121 University Place, Pittsburgh

Public Health Dentistry: Bruce D. Forsyth, USPHS, Fourth and D Sts., S.W., Washington, D.C.

Research: John W. Knutson, USPHS, Federal Security Building South, Washington, D.C.

Roentgenology: William J. Updegrave, 230 W. Duncannon Ave., Philadelphia

THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION
222 East Superior Street, Chicago 11, Illinois
WHitehall 4-6730

LON W. MORREY, *Editor* JOHN J. HOLLISTER, *Business Manager*

All expressions of opinions and all statements of supposed facts are published on the authority of the writer over whose signature they appear, and are not to be regarded as expressing the views of the American Dental Association, unless such statements or opinions have been adopted by the Association. *Articles* are accepted with the understanding that they have not been published previously and that they are submitted solely to THE JOURNAL. *Advertising copy* must conform to the official standards established by the American Dental Association. *Notice of change of address* should be received one month before the change is to be effective. *Orders of reprints of* JOURNAL articles must be received by the Business Manager's office not later than the 15th of the month of issue in order to secure advantage of the lowest possible prices. Orders received after this date are subject to special quotation.

Announcements

MEETINGS OF THE AMERICAN DENTAL ASSOCIATION

Ninety-Third Annual Session	Sept. 8-11, 1952	St. Louis
Ninety-Fourth Annual Session	Sept. 28-Oct. 1, 1953	Cleveland
Ninety-Fifth Annual Session	Nov. 8-11, 1954	Miami

MEETINGS OF STATE SOCIETIES

State	Date	Place	Secretary	Address
Alabama	Apr. 14, 15	Birmingham	G. W. Matthews	1922 Tenth Ave., S., Birmingham 5
Alaska	July 14-17	Anchorage	R. A. Smithson	Box 1293, Anchorage
Arizona		Phoenix	E. M. Scott	17 E. Welden Ave., Phoenix
Arkansas	Apr. 6-9	Little Rock	D. M. Hamm	White Bldg., Clarksville
California	Apr. 21-23	San Francisco	L. R. Ludwigsen	450 Sutter St., San Francisco
S. California	May 5-7	Los Angeles	C. A. Moss	1401 S. Hope St., Los Angeles
Colorado	Oct. 5-8	Colorado Springs	R. A. Downs	724 Republic Bldg., Denver 2
Connecticut	May 21-23	Bridgeport	E. S. Arnold	37 Linnard Rd., W. Hartford
Delaware	Jan.		S. J. Krygier	309 S. State St., Dover
District of Columbia	Mar. 9-12	Washington	K. H. Wood	202-1835 Eye St., N. W., Washington
Florida	Apr. 20-23	Jacksonville	T. A. Price	808 Congress Bldg., Miami
Georgia	Nov.	Savannah	J. M. Heard, Jr.	803 Persons Bldg., Macon
Hawaii		Honolulu	J. H. Dawe	810 N. Vineyard St., Honolulu 17
Idaho	June 30-July 2	Sun Valley	F. E. Carpenter	123 Main Ave., W., Twin Falls
Illinois	May 19-22	Springfield	P. W Clopper	623 Jefferson Bldg., Peoria 2
Indiana	May 12-14	Indianapolis	E. E. Ewbank	Kingman
Iowa	May 5-7	Des Moines	H. I. Wilson	639 Insurance Exchange Bldg., Des Moines
Kansas	May 11-14	Topeka	F. A. Richmond	861 Brotherhood Bldg., Kansas City
Kentucky	Mar. 31-Apr. 2	Louisville	A. B. Coxwell	1976 Douglas Blvd., Louisville
Louisiana	Apr. 17-19	Shreveport	J. S. Bernhard	2515 Line Ave., Shreveport
Maine	June	Rockland	S. Gower	Skowhegan
Maryland	May 4-7	Baltimore	E. L. Pessagno, Jr.	415 Medical Arts Bldg., Baltimore 1
Massachusetts	May 4-7	Boston	H. E. Tingley	12 Bay State Road, Boston
Michigan	Apr. 21-23	Detroit	F. Wertheimer	Michigan Dept. of Health, Lansing
Minnesota	Feb. 18-20	St. Paul	C. V. E. Cassel	242 Lowry Medical Arts Bldg., St. Paul
Mississippi	June 9-12	Biloxi	H. M. Campbell	102 Professional Bldg., Tupelo
Missouri	Sept. 12	St. Louis	R. R. Rhoades	201 Merchants Bank Bldg., Jefferson City
Montana	May 8-10	Butte	C. S. Renouard	304 Phoenix Bldg., Butte
Nebraska	May 12-14	Omaha	F. A. Pierson	1112 Federal Securities Bldg., Lincoln
Nevada	June	Reno	R. La Fond	Medical Dental Bldg., Reno
New Hampshire	June 29-July 1	Bretton Woods	F. E. Williams	814 Elm St., Manchester
New Jersey	Apr. 23, 24	Atlantic City	J. G. Carr	407 Cooper St., Camden
New Mexico	Apr. 14-16	Roswell	J. S. Ellar	Suite 7, Medical Arts Square, Albuquerque
New York	May 12-15	Syracuse	C. A. Wilkie	1 Hanson Place, Brooklyn
North Carolina	May 11-14	Pinehurst	B. N. Walker	Liberty Life Bldg., Charlotte
North Dakota	May 15-17	Minot	J. H. Lunday	302 Black Bldg., Fargo
Ohio			E. G. Jones	185 E. State St., Columbus
Oklahoma	Apr. 20-23	Oklahoma City	R. C. Calkin	109½ W. Oklahoma, Guthrie
Oregon	Mar. 3-5	Portland	H. C. Fixott, Jr.	308 Selling Bldg., Portland
Panama Canal Zone			O. Slavin	Box 415, Balboa
Pennsylvania	May 4-7	Reading	M. D. Zimmerman	217 State St., Harrisburg
Puerto Rico	Jan. 25-27	San Juan	R. Carrasquillo	Box 214, Rio Piedras
Rhode Island	Jan. 15, 16	Providence	M. L. Biderman	144 Westminster St., Providence
South Carolina		Greenville	J. R. Owings	7 Medical Court, Greenville
South Dakota	May 18-20	Mitchell	E. W. Elmen	Sioux Falls
Tennessee	May 5-7	Memphis	W. L. McCulley	Brown Bldg., Cleveland

State	Date	Place	Secretary	Address
Texas	Apr. 28-May 1	Fort Worth	W. Ogle	3607 Gaston Ave. Medical Bldg., Dallas
Utah	June 11-14	Zion National Park	E. O. Thompson	915 Medical Arts Bldg., Salt Lake City
Vermont	May	Woodstock	W. J. Reardon	Rutland
Virginia	Apr. 28-30	Virginia Beach	J. E. John	804 Medical Arts Bldg., Roanoke
Washington	May 15-17	Seattle	C. R. Flood	1130 Medical-Dental Bldg., Seattle
West Virginia	July	White Sulphur Springs	A. B. Drake	508 West Virginia Bldg., Huntington 1
Wisconsin	Apr. 14-17	Milwaukee	R. A. Mason	964 N. 27th St., Milwaukee
Wyoming		Casper	T. J. Drew	State Capitol Bldg., Cheyenne

MEETINGS OF STATE BOARDS OF DENTAL EXAMINERS

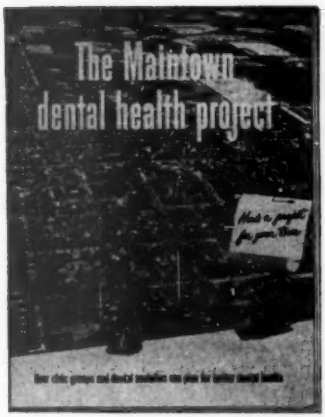
State	Date	Place	Secretary	Address
Alabama	June 16	Birmingham	M. D. Edwards	132 Adams Ave., Montgomery
Alaska	July 7-11	Anchorage	J. H. Geyer	P. O. Box 915, Juneau
Arizona			R. K. Trueblood	25 N. Second Ave., Glendale
Arkansas	June 23-26		H. O. Weatherly	205 Halter Bldg., Conway
California			K. I. Nesbitt	507 Polk St., San Francisco 2
Colorado	June 23-27	Denver	C. K. Phillips	724 Republic Bldg., Denver 2
Connecticut			C. G. Brooks	302 State St., New London
Delaware			P. K. Musselman	143 W. Main St., Newark
District of Columbia			W. M. Falls	1801 Eye St., N. W., Washington 6
Florida	July 7-12*	Jacksonville	A. W. Kellner†	P. O. Box 155, Hollywood
Georgia			S. H. Yarbrough	Medical Arts Bldg., Columbus
Hawaii	Feb. 20-23	Honolulu	H. L. Houvener	427 Dillingham Bldg., Honolulu
Idaho			W. K. Adams	718 Arthur St., Caldwell
Illinois			W. A. McKee	503 Wood Bldg., Benton
Indiana	June 17-20*	Indianapolis	C. A. Frech	504 Broadway, Gary
Iowa	May 19-23	Iowa City	H. M. Willits	719 Roshek Bldg., Dubuque
Kansas			G. L. Teall	Box 71, Hiawatha
Kentucky			R. I. Todd	Western Union Bldg., Richmond
Louisiana			A. R. deNux	Marksville
Maine			R. A. Derbyshire	Box 387, Skowhegan
Maryland			H. Levin	3429 Park Heights Ave., Baltimore 15
Massachusetts			J. C. Wilson	State House, Boston 33
Michigan	Jan. 27-Feb. 2	Ann Arbor	J. L. Champagne	3714 W. McNichols Road, Detroit 21
	June 8-14			
Minnesota			F. A. Larson	1632 Washington St., N. E., Minneapolis
Mississippi	Jan. 7	Jackson	J. C. Boswell	508 Lamar Life Bldg., Jackson
Missouri			R. R. Rhoades	Central Trust Bldg., Jefferson City
Montana			P. M. Feda	Box 865, Helena
Nebraska			C. A. Bumstead	924 Stuart Bldg., Lincoln
Nevada			G. C. Steinmiller	Masonic Temple, Reno
New Hampshire			J. B. Brown	5 N. State St., Concord
New Jersey			W. A. Wilson	150 E. State St., Trenton 8
New Mexico			J. J. Clarke, Sr.	Artesia
New York			D. W. Beier	23 S. Pearl St., Albany 7
North Carolina			F. O. Alford	1109 Liberty Life Bldg., Charlotte 2
North Dakota	July 7-11	Fargo	A. B. Crabtree	Ellendale
Ohio			H. B. Smith	322 E. State St., Columbus
Oklahoma			J. B. Cole, Jr.	706 Asp, Norman
Oregon	June 9-12*		A. F. Davis	306 Public Service Bldg., Portland
Pennsylvania	June 19-21**	Philadelphia	R. E. V. Miller	Northampton National Bank Bldg., Easton
	June 21††			
	June 23-25†	Philadelphia and Pittsburgh		
Puerto Rico		Santurce	L. C. Coll	Box 3717, Santurce
Rhode Island			F. M. Hackett	267 Academy Ave., Providence
South Carolina			T. C. Sparks	1315 Pickens St., Columbia
South Dakota			K. A. Stormo	Lead
Tennessee			F. S. Maxey	804 Bennie Dillon Bldg., Nashville 3
Texas			R. T. Weber	312 Capital National Bank Bldg., Austin
Utah			F. E. Lees	324 State Capitol Bldg., Salt Lake City
Vermont			F. A. Reid	Windsor
Virginia			J. M. Hughes	715 Medical Arts Bldg., Richmond 19
Washington			J. B. Kiefer, Jr.	510 Cobb Bldg., Seattle

State	Date	Place	Secretary	Address
West Virginia	June 23-25	West Liberty	C. A. Laughlin	613 Prunty Bldg., Clarksburg
Wisconsin	June 16-20*	Milwaukee	S. F. Donovan	Tomah
Wyoming	June 23-25	Casper	W. A. Hocker	212 O & S Bldg., Casper

*Dentistry and dental hygiene.
**Dental clinical examinations.
†Dental and dental hygiene written examinations.
††Dental hygiene clinical examinations.

MEETINGS OF OTHER ORGANIZATIONS

Name	Date	Place	Secy. or Chm.	Address
Academy of Denture Prosthetics	Mar. 16-22	New Orleans	I. L. Furnas Secy.	928 Silverado St., La Jolla, Calif.
American Academy of Dental Medicine	May 29-31	Montreal, Canada	W. M. Greenhut, Secy.	124 E. 84th St., New York 28
American Academy of Oral Pathology	Feb. 3	Chicago	J. L. Bernier Secy.	Registry of Dental and Oral Pathology, Army Medical Museum, Washington, D.C.
American Academy of Restorative Dentistry	Feb. 2, 3	Chicago	A. G. James Secy.	409 N. Camden Drive, Beverly Hills, Calif.
American Association of Endodontists	Feb. 2, 3	Chicago	N. W. Burkman Secy.	525 Merrill St., Birmingham, Mich.
American Association of Industrial Dentists	Apr. 22-24	Cincinnati	E. R. Aston Secy.	1400 N. Cameron St., Harrisburg, Pa.
American Association of Orthodontists	Apr. 21-24	St. Louis	G. R. Moore Secy.	919 Oakland Ave., Ann Arbor, Mich.
American Board of Orthodontics	Apr. 16-20	St. Louis	C. E. Martinek Secy.	661 Fisher Bldg., Detroit 2
American Board of Pedodontics	Aug. 4-7	San Francisco	R. L. Ireland Secy.	College of Dentistry, University of Nebraska Lincoln, Neb.
American Board of Prosthodontics	Jan. 28-Feb. 2	Milwaukee	I. R. Hardy Secy.	Tufts College Dental School, 136 Harrison Ave., Boston 11
American Denture Society	Feb. 2, 3	Chicago	A. L. Roberts Secy.	Aurora National Bank Bldg., Aurora, Ill.
American Society for the Advancement of General Anesthesia in Dentistry	Mar. 24	New York	M. H. Feldman Exec. Secy.	730 Fifth Ave., New York 19
Chicago Dental Society	Feb. 4-7	Chicago	K. S. Richardson Exec. Secy.	30 N. Michigan Ave., Chicago
Council on Dental Education, Division of Aptitude Testing	Mar. 7, 8		S. Peterson Secy.	222 E. Superior St., Chicago 11
Denver Dental Association	Jan. 6-9	Denver	R. R. Maier Secy.	724 Republic Bldg., Denver 2
Eleventh International Dental Congress	July 19-26	London, England	G. H. Leatherman Hon. Secy.	13 Hill St., London W. 1, England
Greater Philadelphia	Jan. 30-Feb. 1	Philadelphia	R. Adams Secy.	1411 Walnut Street Bldg., Philadelphia 2
International Academy of Anesthesiology	Feb. 6	New York	I. G. Tomack Secy.	355 E. 149th St., New York 55
National Board of Dental Examiners	Apr. 7, 8		S. Peterson Secy.	222 E. Superior St., Chicago 11
Northeastern Society of Orthodontists	Mar. 3, 4	New York	O. Jacobson Secy.	35 W. 81st St., New York
Northwest Conference in Dental Medicine	Apr. 13-17	Hood River, Ore.	P. L. Meacham Secy.	426 Medical Arts Bldg., Portland, Ore.
Southern Academy of Oral Surgery	Mar. 22, 23	Atlanta, Ga.	R. F. Sullivan Secy.	118 E. Jones St., Savannah, Ga.
Thomas P. Hinman Mid-Winter Clinic	Mar. 23-26	Atlanta, Ga.	R. D. Robinson Gen. Chm.	832 Candler Bldg., Atlanta, Ga.



ada

INTERESTED IN A DENTAL HEALTH PROJECT FOR YOUR COMMUNITY?

The new booklet, "The Maintown dental health project" is an excellent manual for the development of a community dental health project. It tells in a few words how to evaluate the dental resources and needs of a community; how to set up a program and enlist the cooperation of civic agencies.

What Maintown, a fictional community, has done about its dental health problem serves as a practical guide to setting up a project anywhere. You'll find the "Maintown dental health project" the answer to your need for authoritative guidance in this important field. A free, sample copy will be sent on request.

use this order blank

Order Department, AMERICAN DENTAL ASSOCIATION
222 East Superior Street, Chicago 11, Illinois

Check the order you wish to place for MAINTOWN DENTAL HEALTH PROJECT booklets:

- ☐ *25 Copies.....$ 5.85*
- ☐ *50 Copies.....$10.00*
- ☐ *100 Copies.....$17.50*

Please send remittance with order.

name _____

address _____

city _____ *zone* _____ *state* _____

please type or print

CLASSIFIED ADVERTISING

Forms close on 25th of second month preceding month of issue

Remittance Must Accompany Classified Ads.

Advertisements cost $3.50 not exceeding 30 words, additional words 10c each. Commercial agency advertisements, $3.50 for 20 words, additional words 13c each. Publisher reserves the right to determine classification. An extra fee of 25c is charged advertisers who have answers sent care of A.D.A. and in such cases we do not furnish name or address to inquirers. This rate applies for each insertion.

PRACTICES AND OFFICES FOR SALE

COLORADO—44-year old practice in prosperous farming and livestock community. County seat town of 8,500, in the heart of fast developing Denver-Julesburg oil basin. Good hunting and fishing. Office recently redecorated; equipment in excellent condition. Direct replies to Mrs. W. R. Conklin, 211 Phelps Street, Sterling, Colorado.

•

FLORIDA—Dental Bungalow practice and equipment. New and fully furnished operating room, laboratory, office and rest room; beautifully furnished reception room. All air conditioned. Modern furniture in living quarters. Wonderful practice for right man. Near Daytona Beach. Owner retiring. Address A.D.A. Box 1.

•

NEW JERSEY—Completely new, furnished and equipped dental office in northern Jersey city of 75,000 population, and well-founded 6-year practice. Present owner will stay as long as necessary to successfully turn over practice to new owner. Address A.D.A. Box 2.

•

NEW YORK STATE—Highly successful dental practice in prosperous upstate central New York town of 10,000. Present owner, leading community dentist for 37 years, is selling to follow other interests. 2-chair office, X-Ray equipment. High earnings given in confidence. Direct replies to Dr. Guy Marshall, Grogan Building, Herkimer, New York.

•

OHIO—Completely equipped dental office, for sale due to death. Located in center of business district in city of 16,000. Reasonable rent. Direct replies to Mrs. C. J. Fackiner, 136 South 12th Street, Cambridge, Ohio.

OREGON—Bungalow office for sale or lease. Near suburban business district; excellent transportation. Owner plans graduate study on release from Navy. Statement of practice income available. Direct replies to Dr. Jess Haydan, Jr., 2800 Spring Drive, Eugene, Oregon.

•

PENNSYLVANIA—Well established dental practice and two chair office equipment and laboratory, for sale due to death. Owner specialized in Orthodontic practice. Fine clientele from large surrounding area. Well furnished offices. Available for immediate rental. Direct replies to Harrisburg Trust Company, Executor, Harrisburg, Pennsylvania.

•

VIRGINIA—Modern Ritter equipped dental office for sale or rent. Two operating rooms, laboratory, reception room. Ground floor, front office; best location in thriving northern Virginia town of 3,000. Rich agricultural area; trading population, 40,000. 69 miles from Washington. Former dentist enjoyed large practice for over 35 years. Direct replies to Mrs. H. B. Lacy, Culpepper Terrace, Culpepper, Virginia.

•

WISCONSIN—Active, two-chair, small-town practice for sale. Fully equipped. Owner doing graduate work. New home for rent to purchaser. Direct replies to Dr. K. E. Follmar, Strum, Wisconsin.

LOCATIONS AVAILABLE

FLORIDA—Dental space for rent; share office with physician. Room for two chairs, plus laboratory, dark room, consultation room, and private waiting room. Completely air conditioned and heated. New, attractive; located on street used by dentists and physicians. Parking space for patients. Direct replies to Dr. Norris Beasley, 1016 East Broward Boulevard, Fort Lauderdale, Florida.

MISSOURI—Fully equipped two-chair office for rent. Ritter equipment, two x-rays, etc. Located in medical building in best residential district in St. Louis. Air conditioned. Good fees; excellent income. Owner going into service in January. Address A.D.A. Box 3.

•

OHIO—Unfurnished dental office with waiting room, for rent. Shared with established busy general medical practitioner. Young man preferred. Direct replies to Mr. Harold M. Garson, 1003 Second National Building, Akron, Ohio.

•

PENNSYLVANIA—Dental office for rent; established 12 years. Excellent location, corner Grange and Park Avenue in Philadelphia. Direct replies to Mr. Harry Leidner, 5739 Park Avenue, Philadelphia 41, Pa.

OPPORTUNITIES AVAILABLE

MARYLAND—Resident in Oral Surgery and Dental Intern wanted, beginning with July 1, 1952. Applicants for Residency must have Postgraduate or previous hospital training. Recent graduate accepted for Internship. Training in all surgical and related subjects. Applicants must be graduates of Accredited dental schools. Direct replies to Executive Director, Sinai Hospital, Baltimore 5, Maryland (Approved by A.D.A.).

•

MASSACHUSETTS—Associate wanted for orthodontic practice in Massachusetts. Must be recent graduate. State qualifications. Address A.D.A. Box 4.

•

MASSACHUSETTS—Pedodontist or young dentist wanted to associate with dentist in college town. Well established; good clientele; office located in group office building. Security assured for qualified person. Address A.D.A. Box 80.

•

MICHIGAN — Philanthropic foundation wants dentist under 40 years of age for public health work. Starting salary rate, $4,500 per annum. Michigan licensure not required provided the individual is a graduate of an accredited dental school and is licensed in another state. For detailed information write Kenneth R. Gibson, D.D.S., M.S.P.H., Director of Child Health Division, Children's Fund of Michigan, 660 Frederick Street, Detroit 2, Michigan.

MICHIGAN—Rural farming town of some 750 population, needs dentist. Located only 24 miles south of Salt Ste. Marie, in good fishing area. Several good stores, grade and high schools, bank, in town. Direct replies to Mr. H. M. Hamilton, Pickford, Michigan.

•

NEW YORK—Associate wanted by long established orthodontist. Excellent opportunity for right man. Must be draft exempt and above average in ability. Address A.D.A. Box 100.

•

OHIO—Dentist under 65 wanted for institution for mentally retarded. Ohio license. Salary $5,040. Apartment and maintenance available. Direct replies to State Hospital, Gallipolis, Ohio.

•

PENNSYLVANIA — Manufacturing concern dealing in electronic equipment, primarily in dental and medical fields, offers employment opportunity—principally sales—to one qualified and financially responsible. Address A.D.A. Box 82.

OPPORTUNITIES WANTED

WANTED—Dental office, practice, location, partnership or other opportunity wanted in Connecticut or New York. Versatile practitioner, service exempt; valuable experience in rehabilitation, surgery, prosthetics. Address A.D.A. Box 101.

•

WANTED—Young practitioner, graduate of University of Pennsylvania, wishes to become associated with dentist in Western Mass. Address A.D.A. Box 6.

•

DENTIST—Seven years experience, married, conscientious, desires position with practitioner in New Jersey or Pennsylvania. Would like office busy enough to afford security and opportunity to capable man. Address A.D.A. Box 7.

•

DENTIST—New York State license, wishes to contact industrial firm, institution or manufacturer who can utilize his services. Vast experience in oral surgery, prosthodontia, operative dentistry. 26 years in private practice and army. 50 years of age, good health, married, no children; will travel. Address A.D.A. Box 8.

EQUIPMENT FOR SALE

FOR SALE—Three year old Ritter Tri-Dent Unit, Ritter pump chair, Operating light, American mobile cabinet. Castle sterilizer. Ivory tan color; like new. Direct replies to Lt. Robert Jeske, Hando Air Base, Hando, Texas.

MISCELLANEOUS

WANTED TO BUY—Old or used dental books or journals. Leo L. Bruder, 1 De Kalb Avenue, Dept. 21, Brooklyn, New York. Dealer in out-of-print Dentistry.

Burneice Larson, Director

The Medical Bureau

Palmolive Building

Chicago, Illinois

OPPORTUNITIES WANTED

WANTED — Opportunites for great group of well qualified Dentists. Among our candidates are those who have specialized in the various fields of Dentistry and, also, men and women qualified for Teaching, Public Health Work and General Practice. Please outline your requirements and credentials of qualified candidates will follow. All negotiations strictly confidential.

OPPORTUNITIES AVAILABLE

WANTED — Dentists qualified in the various Dental specialties and for Teaching, Public Health Work and General Practice. Opportunities in all parts of America including countries outside continental United States. All negotiations strictly confidential. Please send for our ANALYSIS FORM so that we may prepare an Individual Survey of opportunities in your particular field.

CHINESE PROVERB

"One picture is worth more than ten thousand words." . . . If true, then Columbia Dentoforms speak volumes.

Write for Your Copy of CATALOG NO. 33
from "The House of A Thousand Models"

COLUMBIA DENTOFORM CORPORATION

Also Headquarters for Brown Precision Attachments

131 East 23rd Street - - - New York 10

are you MOVING ?

Giving us advance notice will keep the Journal coming to you without interruption. *Here's a handy form to use:*

Name .....

Old Address .....

New Address .....

Mail to American Dental Association, 222 E. Superior St., Chicago 11, Ill.

YOUR PATIENTS BENEFIT

YOU BENEFIT

PARTICIPATING DENTIST

Reserve Plan Inc

TRADE MARK

FOR YOUR CONVENIENCE

YOUR OWN BENEFICIARIES BENEFIT

We believe you too will want to be a Participating Dentist in the Reserve Plan, once you know the facts.

A POST-PAYMENT DENTAL PLAN

Hundreds of A. D. A. dentists are already using this efficient, economical and proven credit plan. We invite you to make full inquiry into the Reserve Plan. You benefit and your patients benefit. We purchase your patient's notes. You receive cash. No red tape. Relieves your worries over credit and delinquent accounts. A life insurance feature, at no extra cost to either you or your patients, assures 100% payment of all Reserve Plan credit accounts in case of death.

Reserve Plan Inc

TRADE MARK

2

922 Walnut Street **Kansas City 6, Missouri**

Assets over $1,000,000.00

References: Commerce Trust Bank, Kansas City, Mo. — Better Business Bureau — Dun and Bradstreet

For complete information without obligation mail this coupon TODAY!

RESERVE PLAN INC. Dept., 13-1
922 Walnut St., Kansas City 6, Missouri

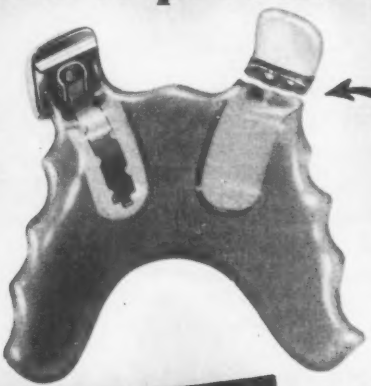
Please (call on me) (mail me information) about your plan for PURCHASING dental notes. The most convenient time to see me is between the hours of_____ and_____ on the following days of the week_____.
No obligation to me, of course.

NAME_____

ADDRESS_____

CITY_____ STATE_____

How to prevent breakage



HERE

— in plastic partials that include one or more *isolated* teeth

REINFORCE

the thin, small area of vulcanite or acrylic material supporting the isolated tooth – use Steele's new DENTURE BACKING with adjustable reinforcing bar

The adjustable reinforcing bar of this new Steele's backing is embedded in the denture material – becoming an integral part of the denture. It adds strength and rigidity to the thin, narrow area of denture material on which the isolated tooth is mounted. The denture backing is designed for a standard Steele's facing – either Flatback or P. B. E. A shoulder on the lingual of the backing provides an accurate finish line for the denture material. The technic is simplicity itself.

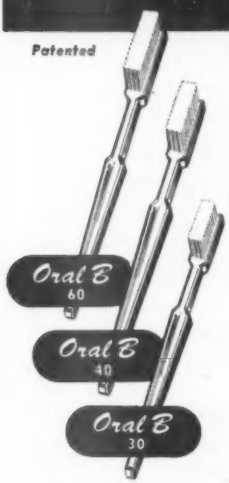
Drop us a postal card asking for Steele's "Denture Backing Technic"

Steele's

The Columbus Dental Mfg. Co.
Columbus 6, Ohio

Try This Softer Brush!

Patented



3 SIZES AND ONLY 1 TEXTURE

*Oral B 60 shown above

Feel the Difference!

Depress the bristles and let the Oral B tell it's own story. Feel the 2500 softer, finer bristles*—3 times *more* than an ordinary brush . . . and many *more* than any similar brush. The result is a superior cleansing job plus gingival massage without injury. For many years, Professional men recognized the need for this type of brush. Then Oral B *pioneered* the field to bring you the answer. Try it yourself and *feel* the difference!

Write today for complete information

Oral B® Company

315 SOUTH FIRST STREET
DEPT. C, SAN JOSE 13, CALIF.

INCOME TAX

Reporting Made Easy!

- The Daily Log for Dentists provides an itemized running account of your PROFESSIONAL EXPENSES throughout the year.
- The Daily Log provides forms for PERSONAL EXPENSES. There is no unscrambling of data at income tax reporting time.

The DAILY LOG is designed specifically for the dental profession. This one-volume record book assists in practice management — saves time, money, good-will — helps you avoid tax troubles—aids in litigation.

The Daily Log record system is simple in design—easy to teach a new office assistant—requires a minimum of your valuable time as each entry *counts*—there's no duplication or lost motion. It enables you to keep close check on expenses, shows how collections are coming in, provides a clear cut summary of your entire year's business. When completed and filed away at the end of the year, it will be the busiest reference book on your shelf. The re-order rate is more than 90%, proof of its acceptance and regard by dentists across the nation.

GUARANTEED to supply the most efficient one-volume financial record system for your office—or instant refund of your money.

MAIL COUPON BELOW!

Colwell Publishing Co.
262 University Ave.
Champaign, Illinois

☐ Please send me the 1952 Daily Log for approval. Check for $6.50 enclosed.

☐ Send FREE catalog showing complete line of Colwell record supplies.

Name .....

Address .....

.....

TM ALL-PURPOSE VIBRATOR

POWER

- **ENOUGH FOR HEAVIEST FLASKS**
- Takes trays, inlays and heaviest flasks
- Compact—only 4½" square
- Beautiful grey hammerloid finish
- Guaranteed for long service

Price only $17.50. See your dealer or write

The TOOTHMASTER CO. RACINE, WIS.

REDUCED—

WITH
EUGENOL OR FORMALDEHYDE

AMMONIACAL SILVER NITRATE SOLUTION

Accepted COUNCIL ON DENTAL THERAPEUTICS AMERICAN DENTAL ASSOCIATION

IN THE DROPPER BOTTLE IS

NEAT
CLEAN
ECONOMICAL

"THE DROP HITS THE SPOT"

AMMONIACAL SILVER NITRATE SOL. $2.00
EUGENOL, U.S.P.—$.50
12½% FORMALDEHYDE SOL.—$.50

A PRODUCT OF

KING'S SPECIALTY CO.
FORT WAYNE, IND.

Look at this!

Tru-Rugae Now you get tissue-tongue natural rugae on Ticonium cases!

No mechanical polishing erases sharp rugae impression. Ti-Lectro polisher brightens case. TRU-RUGAE technique captures the sharpness!

Result? Partials and full dentures that look better — actually aid patients' diction. Ask for TRU-RUGAE!

For new developments . . . look to **TICONIUM**

413 N. Pearl St., Albany 1, N. Y.

Ask Your Ticonium Laboratory About This New Technique

TICONIUM—413 N. PEARL ST., ALBANY 1, N. Y.

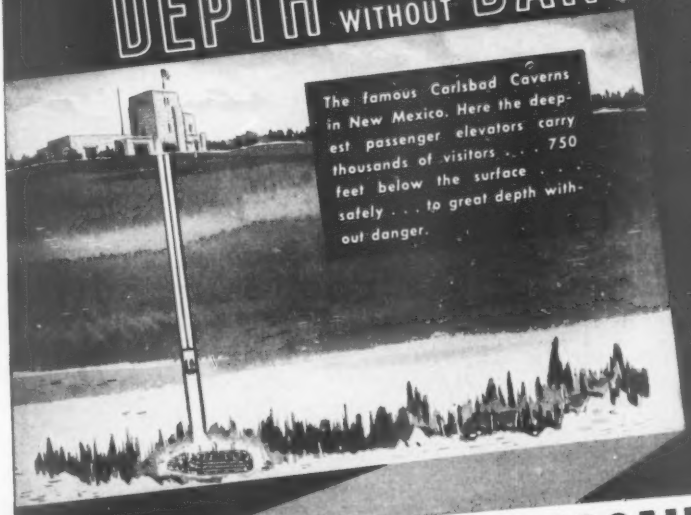
PLEASE SEND ME DETAILED INFORMATION ON THOMPSON TRU-RUGAE

DR. .....

STREET .....

CITY .....ZONE .....STATE .....

DEPTH WITHOUT DANGER


The famous Carlsbad Caverns in New Mexico. Here the deepest passenger elevators carry thousands of visitors . . . 750 feet below the surface . . . safely . . . to great depth without danger.

The *Safety First* LOCAL ANESTHETIC

MONOCAINE 2ME

Accepted Council on Dental Therapeutics American Dental Association

Monocaine 2ME is your assurance of *Depth Without Danger* in local anesthetic administration! Monocaine 2ME produces anesthesia as deep as a 4% procaine solution, yet its toxicity is that of 2.66% procaine. Induction of anesthesia is rapid; the anesthesia is deep, smooth and safe.

Only Monocaine 2ME offers such *depth without danger* — it combines great potency with maximum safety. *Use Monocaine 2ME in your practice!*

40 Years Against Pain 1911-1951

Novocol CHEMICAL MFG CO., Inc.
2911-23 ATLANTIC AVE., BKLYN. 7, N.Y.
Toronto • London • Buenos Aires • Rio de Janeiro

"Remember the Alamo"

The war for Texan Independence produced this stirring cry that still rallies citizens of the Lone Star State.

On February 23, 1836, 4000 Mexicans under command of Santa Anna laid siege to the Alamo and its 180-man garrison. After a furious thirteen day battle, the Texans were slaughtered in a final hand-to-hand struggle. Santa Anna's victory was short-lived, however, for a band of Texans, led by Sam Houston, defeated and captured him on April 21, 1836.

It was just ten years after this that the first Bicarbonate of Soda was produced in the Western Hemisphere by our founders Dr. Austin Church and John Dwight.

Dentists have found no other dentifrice so useful in so many ways as pure sodium bicarbonate. Arm & Hammer or Cow Brand Baking Soda are U. S. P. bicarbonate. Recent research has proved low-cost bicarbonate of soda an efficient dentifrice for L. Acidophilus reduction.

Soda's gentle action cleans teeth safely . . . whitens teeth to original shade without harm to enamel. When used as a gargle or rinse, it freshens the mouth and removes debris.

Children's Storybooks. We have a series of illustrated storybooks for children. They're approved both by leading educators and the Council on Dental Health. If you would like a free supply for your waiting room, just write to us at the address below.

Accepted
COUNCIL on DENTAL THERAPEUTICS
AMERICAN DENTAL ASSOCIATION

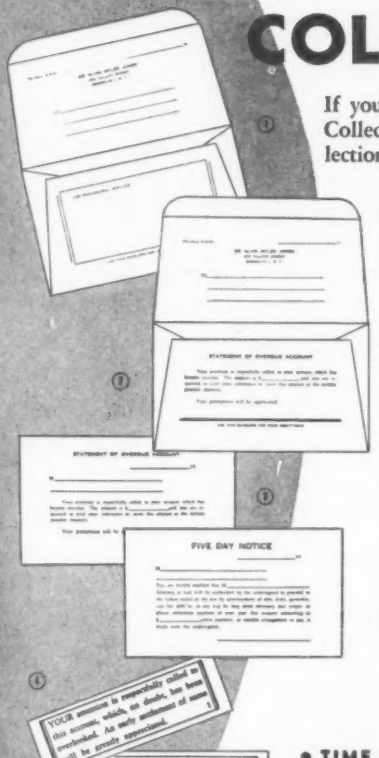
CHURCH & DWIGHT CO., INC.

10 Cedar Street • New York 5, N. Y.

BUSINESS ESTABLISHED IN 1846

HISTACOUNT PRODUCTS

INCREASE COLLECTIONS!



If you extend credit, these fine "Histacount" Collection Aids will help you increase collections . . . effectively and economically!

❶ BILLVELOPES...
A combination bill and self-addressed, reply envelope. Billvelopes make it easy for the patient to enclose remittance and mail it back to you.

❷ COLLECTVELOPES...
A selection of five notices requesting payment of an overdue account. Printed on self-addressed, reply envelopes to bring prompt results.

❸ COLLECTION CARDS...
Send Collection Cards to delinquent accounts. Select from five courteous, yet emphatic, cards which culminate with a Legal Demand for Payment.

❹ COLLECTION STICKERS...
These colorful stickers, when attached to a bill, get attention. Sold in a series of three, each message more emphatic than the previous one.

• TIME PAYMENT CARDS • STATIONERY
• BILLHEADS • CONTRACT CARDS

ACTUAL SAMPLES ON REQUEST

PROFESSIONAL PRINTING COMPANY, INC.
202-208 TILLARY STREET. BROOKLYN 1, N. Y.

Gentlemen: Please send ACTUAL samples of "Histacount" Collection Aids.

Dr. _____ (Degree)

Address _____

Town & State _____

6-1-2

SCALPEL SHARP
BUSCH BURS!
The sharper the steel—the less painful the cut!
That's why Dentists prefer BUSCH BURS. You'll find their
"feather-touch" performance is smoothest,
fastest and least trying to the patient.
PFINGST & COMPANY, INC • 62 COOPER SQUARE • NEW YORK 5, N. Y.

INSURANCE

FOR DENTISTS, PHYSICIANS, SURGEONS EXCLUSIVELY
Accident • Hospital • Sickness

Cost has never exceeded amounts shown

$5,000.00 ACCIDENTAL DEATH $25.00 weekly indemnity, accident and sickness	$8.00 Quarterly
$10,000.00 ACCIDENTAL DEATH $50.00 weekly indemnity, accident and sickness	$16.00 Quarterly
$15,000.00 ACCIDENTAL DEATH $75.00 weekly indemnity, accident and sickness	$24.00 Quarterly
$20,000.00 ACCIDENTAL DEATH $100.00 weekly indemnity, accident and sickness	$32.00 Quarterly

Also hospital expense for members, wives and children at small additional cost

85c out of each $1.00 gross income used for members' benefit

$4,000,000.00
INVESTED ASSETS

$17,800,000.00
PAID FOR CLAIMS

$200,000.00 deposited with State of Nebraska for protection of our members

Disability need not be incurred in line of duty—benefits from the beginning day of disability

PHYSICIANS CASUALTY ASSOCIATION
PHYSICIANS HEALTH ASSOCIATION

49 years under the same management

400 FIRST NATIONAL BANK BUILDING **OMAHA 2, NEBRASKA**

BRONZE IS BACK AGAIN

SOLID BRONZE NAME SIGNS—Cast, raised letters, drilled, with screws

3" x 12" — $10.80	3" x 14" — $12.60	3" x 16" — $14.40
4" x 14" — $16.80	4" x 16" — $19.20	4" x 18" — $21.60
5" x 16" — $24.00	5" x 18" — $27.00	5" x 20" — $30.00
6" x 18" — $32.40	6" x 20" — $36.00	6" x 25" — $45.00

Other signs 30c per square inch. Signs with wording on both sides 45c per square inch.
PLEASE SEND CHECK WITH ORDER

LAUER METAL SHOP • 1516 E. Baltimore Street • Baltimore 31, Md.

For a Good, Reliable Broach, You Can't do Better than use a
UNION BROACH

Manufactured and used over 40 years. Made with the utmost accuracy and precision, of the finest materials obtainable . . . Made in Coarse, Medium, Fine, X-Fine, XX-Fine and XXX-Fine.

Union Stainless Steel Broaches	$1.50 per doz.	$16.00 per gr.
Union Regular Steel Broaches	.65 per doz.	6.90 per gr.
Mounted Short Stainless Broaches	$2.00 per doz.	Regular $1.75 per doz.
SPECIAL—Extra Coarse Union Broaches	$1.50 per doz.	$16.50 per gr.

Sold by Better Dealers Everywhere

UNION BROACH CO., Inc., 37 West 20th St., New York 11, N. Y.

KADON

brings you every advantage for the "brush on" technic

1. IRREGULAR PARTICLE STRUCTURE,
a unique characteristic of Kadon powder, is ideally suited to "Brush On" application. With so much of the surface of each particle exposed, wetting is instantaneous. Deep penetration of liquid produces a truly homogeneous filling.

2. HIGHER HEAT OF POLYMERIZATION
causes faster setting in the cavity as the filling is built up in successive layers.

3. The new KADON APPLICATION KIT
Here, for the first time, are instruments of truly professional character for "brushing on" resin restorations. The tapering shanks of the aluminum handles are slotted for easy and secure attachment in the ferrules of the individual brushes.

$4.75

Flint glass dispensing tray
Six detachable brushes
Two aluminum handles

WHATEVER YOUR PREFERENCE IN TECHNIC . . . NON-PRESSURE, CONVENTIONAL, OR INLAY . . .

THE RESTORATIVE RESIN OF CHOICE IS

Jewel MATCHER—Jewel KADON

Kadon brings you the widest range of life-like colors for quick, efficient tooth matching.

Caulk

KADON

REG. U.S. PAT. OFF.

Grinding

THE VENUS DE MILO?

A rash procedure—its classic contours would be ruined. Many denture patients, however, are equally indiscreet in cleaning expensive dentures with abrasive or inefficient household cleansers. You can start them off right, by suggesting Wernet's Dentu-Creme and Wernet's Plate Brush—specially prepared for safe, efficient denture cleansing.

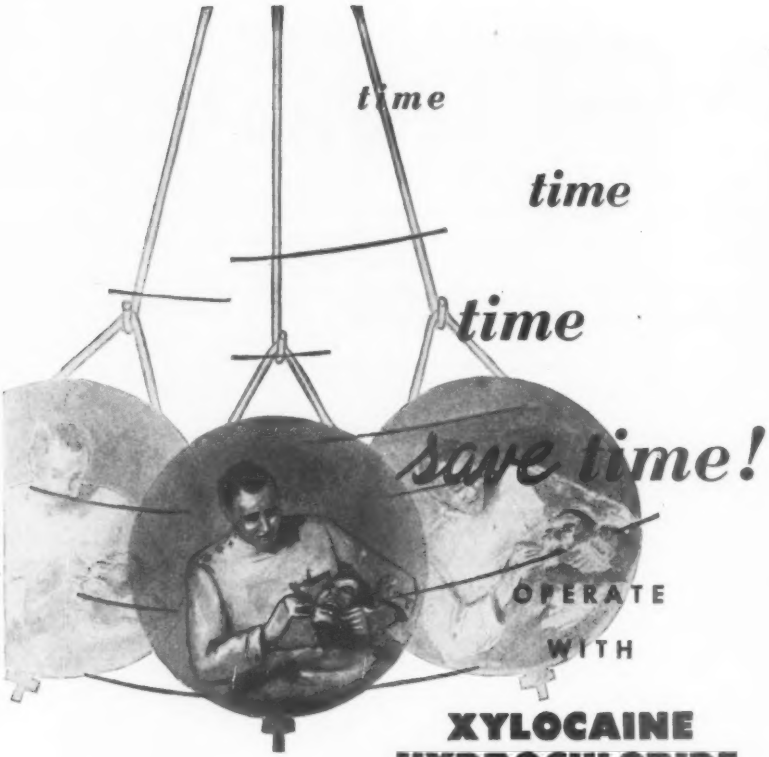
Dentu-Creme is smooth, absolutely non-injurious, and an excellent detergent. Its special polishing agent renders it ideal for use on acrylics.

Wernet's Plate Brush provides two groups of bristles individually anchored-in for long life—a black bristle section for use on the ridge and the vault, and a white bristle section for the teeth and interproximal spaces—conforming to professional specifications.

Together, they provide the perfect combination for thorough removal of mucin plaques, food particles and stubborn stains... without damage to delicate surfaces or fine ridges.

WERNET DENTAL MFG. CO., INC.
JERSEY CITY 2, N. J.
6-A

WERNET'S DENTU-CREME
AND
WERNET'S PLATE BRUSH



XYLOCAINE HYDROCHLORIDE

ASTRA

(Brand of Lidocaine Hydrochloride)

Dispensed for dentistry in 1.8 cc cartridges. 2% solution available without epinephrine; and with epinephrine 1:100,000 or 1:50,000.

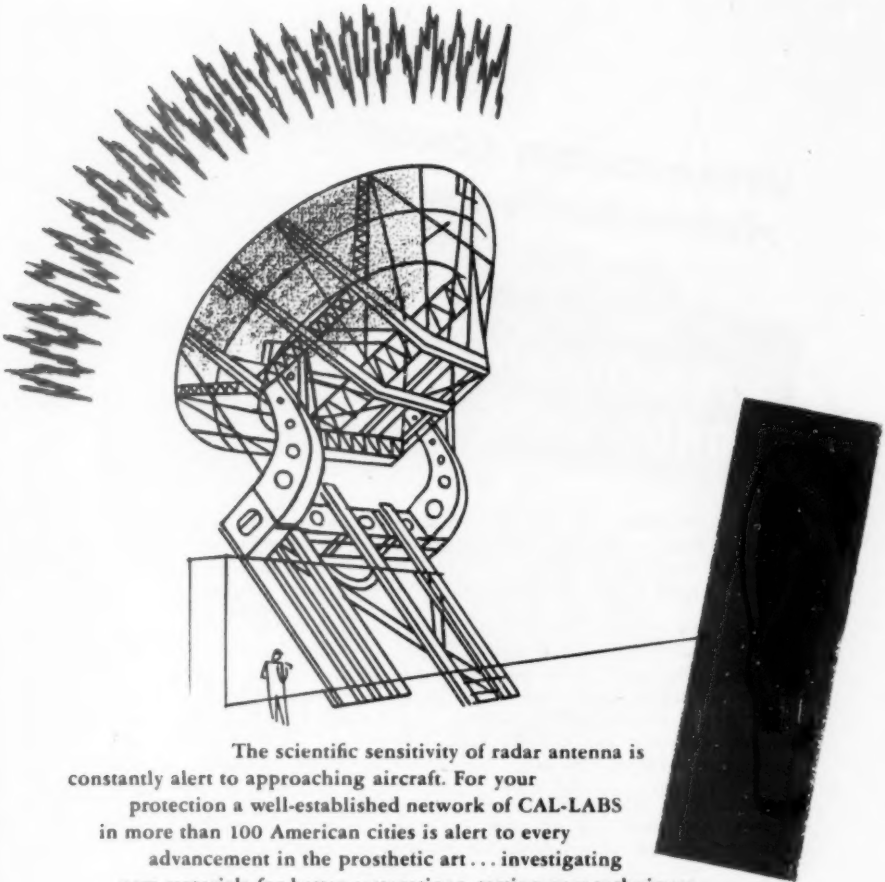
the new, quick-acting local anesthetic that cuts minutes from the time lag between injection and onset of anesthesia. Anesthetic effect is profound, widely diffused, and well within clinical ranges of tolerance.

Bibliography sent upon request.

ASTRA

PHARMACEUTICAL PRODUCTS, INC.
WORCESTER, MASS. U. S. A.

SOLD THROUGH LEADING DENTAL SUPPLY HOUSES



The scientific sensitivity of radar antenna is constantly alert to approaching aircraft. For your protection a well-established network of CAL-LABS in more than 100 American cities is alert to every advancement in the prosthetic art . . . investigating new materials for better restorations, testing new techniques, co-operating with each other and their Central Research Organization in developing new ways and means of designing and constructing more successful full and partial dentures. The actual value of this service to YOU is evidenced by the fact that the Cal-Lab group is producing an ever increasing number of finer fitting, functionally pleasing and more life-like appliances. For a demonstration of this service, call the Cal-Lab nearby.

CERTIFIED AKERS LABORATORIES cal SERVICE *

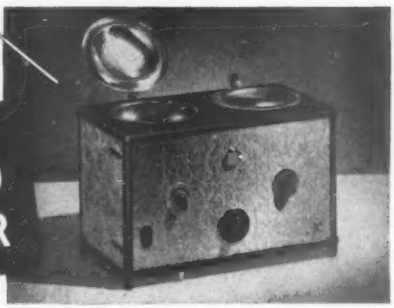
The CAL-LAB Group

Do you read CAL magazine?
Ask your CAL-LAB to send it to you.

* REG U S PAT OFF

HYDROCOLLOID CONDITIONED *Automatically*

HYDROCOLLOID CONDITIONER



With the Hanau Electric Hydrocolloid Conditioner, each conditioning stage — boiling, storing, tempering — is performed under accurate, automatic control. Formerly, even the most painstaking methods gave no assurance of uniformly successful results.

Complete in itself, the Hanau Conditioner provides: a timer-controlled Quick-Boiler, for hydrocolloids in tubes or syringes; for automatic accuracy in the storing and tempering stages, two removable covered stainless steel receptacles controlled by individual thermostats over a range of 90° — 212° F.; a lifting rack for each receptacle — one for upright support and convenient handling of tubes and syringes, the other for immersing filled impression trays.

Thus, with this compact unit you not only prepare your requirements in a matter of minutes, but also you have properly conditioned hydrocolloid available for immediate use all day long.

HANAU HYDROCOLLOID SYRINGES *Feature Unique Air Release Valve*

Moulded rubber covering permits immediate handling after removal from conditioning unit without discomfort to hands or patient, and insulates against temperature change of the hydrocolloid in the syringe. An air valve in the plunger releases trapped air before material is expelled, and prevents the plunger from "popping out" during boiling.

Two sizes meet every need: LARGE — for filling impression trays. SMALL — for applying material to prepared teeth.

Obtain full details from your dealer, or write Hanau for descriptive literature.

HANAU ENGINEERING CO., INC.
1233 Main St. • Buffalo 8, N. Y.

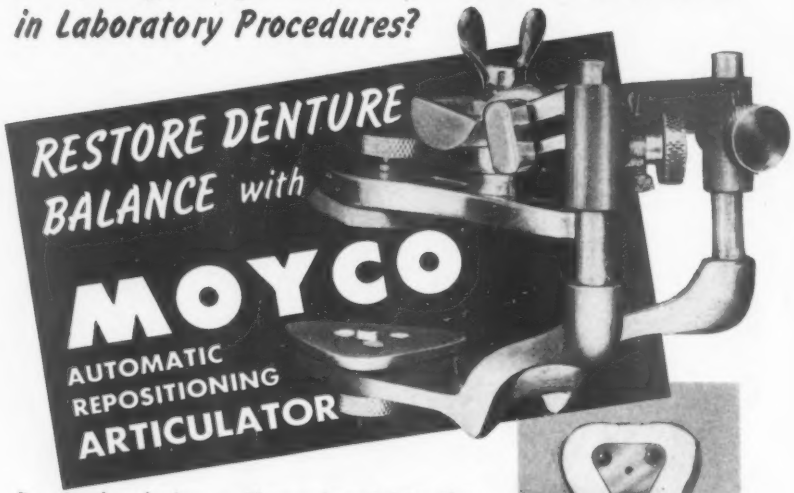
WIDEST SHADE RANGE
LARGEST MOLD RANGE
GREATEST RETENTION AREA
DENTAL PEARL
PLUS AREA
SR
Teeth
62 • 65 • 66 • 67 • 69 • 77 • 81
Seven natural gray shades
25 • 30 • 35 • 40 • 45 • 50 • 55
Seven vibrant yellow shades
PLUS
Solvent Resistance with
DEPENDABLE RETENTION
JUSTI
Products for Better Dentistry
H. D. JUSTI & SON, INC.
PHILADELPHIA 4, PENNSYLVANIA

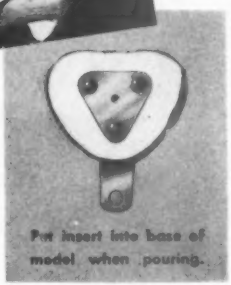
Are you getting **DIMENSIONAL CHANGES** *in Laboratory Procedures?*

RESTORE DENTURE BALANCE with

MOYCO

AUTOMATIC REPOSITIONING ARTICULATOR





Put insert into base of model when pouring.

By simply placing a Moyco insert into the base of the model as it is poured, the cured denture — on the model — can be *automatically repositioned* on the Moyco Articulator. Raised bites, shifting teeth, etc., can readily be milled to obtain original balance.

- *Messy, time-consuming plaster is eliminated* for fastening models to the articulator; simply screw the Moyco base into the insert. To establish new bite relationship, just move the articulator into new relationship with the insert. No breaking away of plaster—no repairing of plaster.
- *For remounting study models,* the Moyco Articulator is ideal. Simply twist the screws into the inserts and you have the models ready.
- *It is unnecessary to send Articulator to the Laboratory* when both the Dentist and Laboratory use a Moyco Articulator. This is most advantageous, costwise, when mailing.
- *Precision made of hardwearing aluminum and stainless steel* the Moyco is light in weight yet sturdily built. Adjustable spring action supplies lateral and antero-posterior movement for balanced setups.

At your dealer **$15.00**
Includes 2 model inserts.
Additional inserts available @ 2 for 25c

J·B M CO. INC.

THE J. BIRD *Moyer* CO., INC.

117-21 N. FIFTH STREET PHILADELPHIA 6, PA.

KERR Cristobalite

INLAY INVESTMENT

ADAPTABLE TO *Your* BURNOUT TECHNIQUE

Kerr Cristobalite Inlay Investment is *adaptable* to YOUR burnout technique—

Whether you burn out at 800° or at any other temperature up to 1350°!

Reason is that Cristobalite's high thermal expansion occurs at very low temperature. Even before it reaches 800°, it has practically attained its maximum expansion.

Then it holds this high expansion for more than 550°—the complete range needed for virtually any burnout technique.

Only Cristobalite has these features!

And not only in burnout—but in all its handling —Cristobalite is the easiest investment to use.

KERR MANUFACTURING CO.
DETROIT 8, MICHIGAN Established 1891

"I like my
VITALLIUM

A full upper denture and a Vitallium lower partial restored this patient's ability to chew food and to eat properly. The Vitallium partial is inconspicuous and comfortable and is aiding him in keeping his remaining natural teeth in healthy condition.

VITALLIUM

® By Austenal Laboratories, Inc.

AUSTENAL

THERE IS A VITALLIUM

PRESCRIBE...

VITALLIUM PARTIALS

FOR GREATER PATIENT SATISFACTION AND TO ENRICH YOUR PRACTICE

LABORATORIES, INC.

NEW YORK CHICAGO

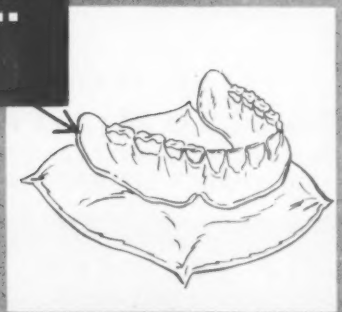
LABORATORY NEAR YOU

at last! a completely satisfactory

resilient tissue bearing surface for dentures!

new D-P veldent...

a cushion of comfort



Exhaustively tested and clinically proved, D-P Veldent is a NEW soft lining material that...

CURES AND BONDS ITSELF molecularly to any Acrylic denture base material during the processing of the case.

IS PERMANENTLY ELASTIC—can neither harden nor exhibit any cold flow characteristics.

IS A PRODUCT OF SILICONE CHEMISTRY, and as such, exhibits extreme resistance to radical changes of temperature, oxidation or corrosion.

IS NOT ABSORPTIVE—Silicones are chemistry's most efficient water vapor barrier.

D P *dental perfection co.*

543 West Arden Ave., Glendale 3, California

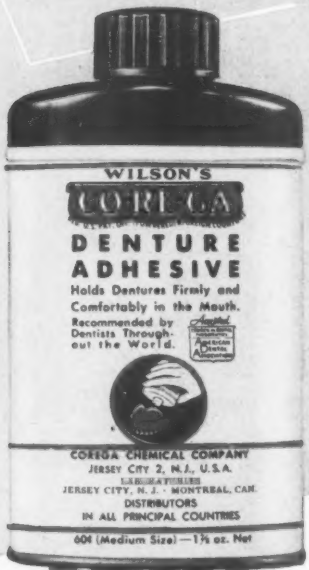
ORDER FROM YOUR DENTAL DEALER TODAY

It's what you do at the chair, doctor
plus
what your patient does at home
that adds up to sound oral hygiene.
IPANA
TOOTH PASTE
Product of BRISTOL-MYERS • 19 West 50 Street, New York 20,

CO-RE-GA

...a name you can trust for conscientious, ethical service;

..a denture adhesive your patients can rely on for quality, purity and performance.



Accepted
COUNCIL ON DENTAL THERAPEUTICS
AMERICAN DENTAL ASSOCIATION

Mail this coupon for your supply of professional samples

PLEASE PRINT

Dr. _____

Address _____ State _____ 21-K

City _____

CO-RE-GA CHEMICAL CO. • 76 Mill Road, Jersey City 6, N. J. 22-A

CO-RE-GA IS NOT ADVERTISED TO THE PUBLIC

THE MOST POPULAR POPULAR-PRICED CASTING GOLD SINCE 1929

JELENKO

Sturdicast

REG. U.S. PAT. OFF.

for Full and Partial Dentures, Bridges, 1-Piece and Unit Castings, Clasps, Bars, Saddles, etc.

GOLD COLOR

Here's Quality and Performance out of All Proportion to its Modest Price.

per dwt. $1.85

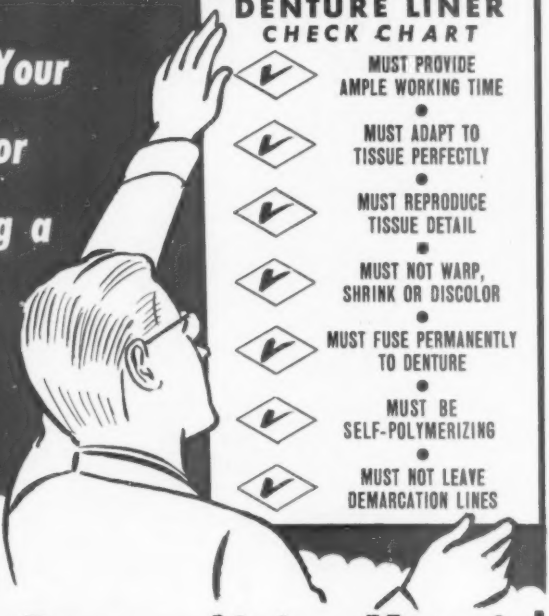
Cast by THERMOTROL

J. F. Jelenko & Co., Inc.

Manufacturers of Dental Golds & Specialties

136 West 52nd Street • New York 19, U.S.A.

Here's Your Guide for Selecting a Denture Reliner

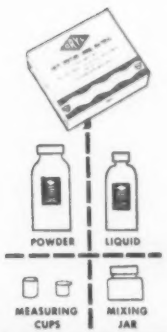


DENTURE LINER CHECK CHART

- MUST PROVIDE AMPLE WORKING TIME
- MUST ADAPT TO TISSUE PERFECTLY
- MUST REPRODUCE TISSUE DETAIL
- MUST NOT WARP, SHRINK OR DISCOLOR
- MUST FUSE PERMANENTLY TO DENTURE
- MUST BE SELF-POLYMERIZING
- MUST NOT LEAVE DEMARCATION LINES

only ORYL

Denture Lining Material Meets ALL Requirements



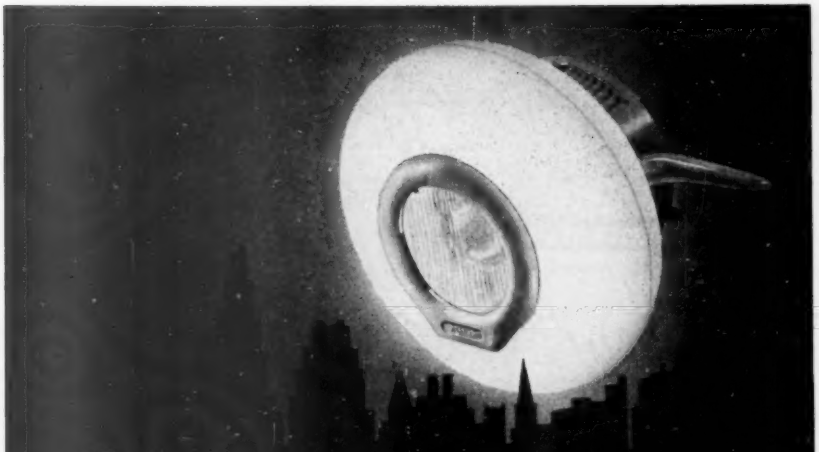
Be sure YOUR rebasing material has EVERY essential characteristic, not only such superficial advantages as "speed" or "at-the-chair rebasing", common to all materials today. Only ORYL gives you these PLUS MORE. For only ORYL comes in an **extra fine grain** powder as to allow all the working time you need to produce a more perfectly adapted, finely textured and patient-satisfying rebase, that warrants the kind of remuneration your efforts deserve. If it is real QUALITY you seek . . . ORYL is **guaranteed** to give it to you. And its economical too!

MORE THAN 40 RELINES—ONLY $12.50

Includes powder and liquid, 2 measuring cups, mixing jar. Choice of clear or pink.

ORDER FROM YOUR DEALER TODAY!

THE WILLIAM GETZ CORPORATION
DENTAL PRODUCTS
7512 GREENWOOD AVE. • CHICAGO 19, ILLINOIS



Bring Sunshine into Your Office

DURING THESE DARK DAYS WITH A

Ritter FUL-VUE LIGHT

CONSTANT DAYLIGHT IN YOUR OPERATING ROOM

With the soft, diffused light of the circline fluorescent tubes, your patients are able to view their restorations in a true light. Your skill receives greater appreciation. In this light you are better able to match teeth. And, you enjoy greater ease and comfort working in good daylight conditions.

COMPLETE ORAL CAVITY ILLUMINATION

The color-corrected light forms an even rectangle to completely illuminate the oral cavity. With far less eye fatigue, you see more clearly the intra-oral field of operation. The concentrated beam produces a clear, white light free from glare, free from excessive heat. The operating spot framed by a halo of fluorescent light gives greater patient comfort.

perfect

S·S·WHITE IMPRESSION PASTE

For correcting full impressions under equalizing pressure, without stimulation of mouth tissue, and without tissue displacement. Can be used with any impression techinque, or in any type of individual impression tray, such as those constructed of Impression Tray Compound, base plate, metal, acrylic or vulcanite.

Tissue surfaces are accurately reproduced under normal conditions. No shrinkage. No expansion. No drying out or moisture absorption. The impression will retain its accuracy indefinitely (at ordinary room temperature—below 88° F.), therefore there is no need for haste in pouring the cast; and the impression may be sent to the laboratory with assurance that it will undergo no dimensional change.

Impressions made from S. S. White Impression Paste may be inserted in the mouth as often as needed for testing the fit without danger of distortion. Ideal for re-base impressions.

S·S·WHITE ELASTIC COLLOID

A reversible hydrocolloid, for taking accurate one-piece impressions of full, partial and orthodontic cases, bridge and pre-extraction cases. Can be withdrawn from extreme undercuts, etc., in one piece. The accuracy of the impression is maintained when there is no water loss, therefore the cast can be poured at the convenience of the operator, or the impression can be safely sent to the laboratory without fear of dimensional change occurring if it is kept moist. Excellent for taking duplicating impressions. Complies with A.D.A. Specification No. 11.

impressions at the first try

S·S·WHITE IMPRESSION TRAY COMPOUND

A black, moderate-heat impression material for making individual trays for impression paste and plaster wash impressions. Also for full and partial impressions, for inlay and jacket crown impressions. Supplied in denture forms and sticks. Complies with A.D.A. Specification No. 3, first revision, for Type 2 Impression Compounds.

S·S·WHITE EXACT IMPRESSION COMPOUND

A quick-setting, low-heat, impression compound. Distinctively brownish-red in color. Becomes plastic at 120° F. (49°C.) Can be used alone for impressions; for perfecting impressions constructed of Impression Tray Compound, and for impressions used in constructing individual impression trays of acrylic vulcanite, etc. Sold in denture forms, sticks and wafers.
The sticks are handy for making corrections, muscle trimming, post-damming, and for taking impressions of inlay and jacket crown preparations.

THE S.S.WHITE DENTAL MFG. CO.
PHILADELPHIA 5, PA.

Reduced emotional hazards and minimal after-effects, in both adults and children, may be achieved in simple extractions with the use of Vinethene.

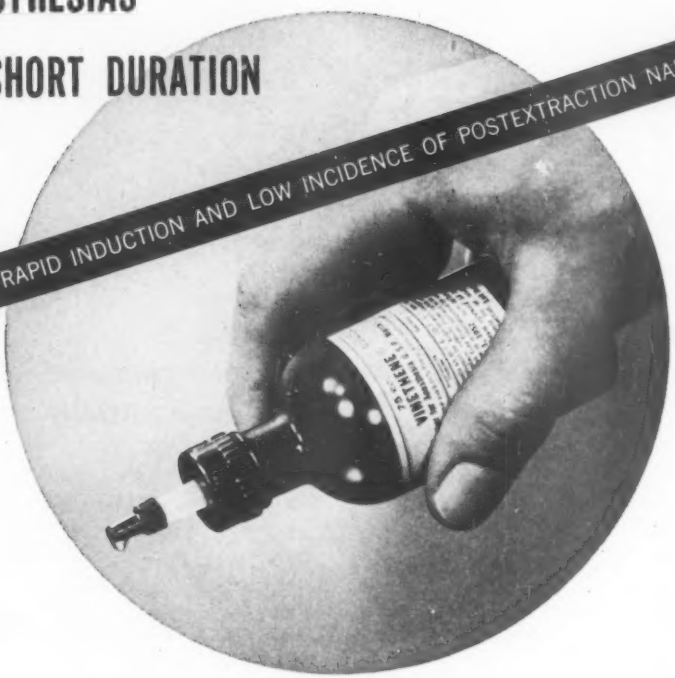
More and more exodontists are using Vinethene, by open-drop administration and in the gas machine, as a complement to nitrous oxide-oxygen. All Vinethene cartons contain the new improved dropping cap.

Literature mailed on request.

Prompt, Uneventful Recovery in

ANESTHESIAS OF SHORT DURATION

WITH RAPID INDUCTION AND LOW INCIDENCE OF POSTEXTRACTION NAUSEA



VINETHENE®

(Vinyl Ether for Anesthesia U.S.P. Merck)
An Inhalation Anesthetic for Short Operative Procedures

COUNCIL ACCEPTED

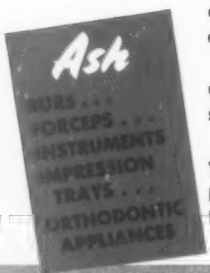
MERCK & CO., INC.
Manufacturing Chemists
RAHWAY, NEW JERSEY
In Canada: MERCK & CO. Limited - Montreal

Prescribe the Butler tooth brush professionally indicated for individual patients with complete confidence. For all Butler *peridental* tooth brushes, with their original narrow-head, straight-line professional design assure massaging of gum tissue and cleansing of ALL teeth properly—even including those hard-to-reach posterior surfaces.

Available in a wide variety of bristle and texture

THE JOHN O. BUTLER COMPANY
540 n. lake shore drive · chicago 11, ill.

BUTLER TOOTH BRUSH . . . favorite for over 29 YEARS!



During the 130 years that the Amalgamated Dental Group of Companies has been delivering fine Dental Products to dentists the world over, it has amassed a tremendous wealth of experience — experience for which there is NO substitute!

The knowledge thus gained is embodied today in the design and manufacture of every product of the Group — from the smallest Bur to the largest equipment.

We at Claudius Ash are proud that we can pass along to you the fruits of this long experience. Every Ash Product you purchase is backed by the time-tested manufacturing skill of the world's oldest producer of fine dental materials.

Claudius Ash, Sons & Co., U.S.A., Inc.
ONE OF THE AMALGAMATED DENTAL GROUP OF COMPANIES
127-131 Coit Street Irvington 11, N. J.

Ash-the Hallmark of Quality Performance in Dental Products

Your generosity is needed to help fellow dentists who have been deprived of the means of making a living through illness and unforeseen disasters. Your once-a-year contribution will help assure the minimum necessities to those who are forced to call on the Relief Fund. An extra few dollars from you will prove to be a blessing.

The A. D. A. Relief Fund acts in cooperation with your State society—which automatically receives one half of your contribution. The A. D. A. Fund pays one half of each grant, your society the other one half.

Send your contribution today to the
AMERICAN DENTAL ASSOCIATION RELIEF FUND
222 E. Superior St., Chicago 11, Ill.

PATIENTS DIFFER

...so does their tolerance to anesthesia

BE SAFE!
CHOOSE THE CORRECT FORMULA
FROM AMONG

Graham's 7 Anesthetics

GRAHAM PROCAINE HCl 4% with Neo-Synephrine* HCl 1:2500 (Graham Catalog #NS)

Extremely valuable in cases where patient has shown susceptibility to Epinephrine or where a deep, short-acting anesthetic is required

Accepted Council on Dental Therapeutics American Dental Association

- PROCAINE HCl 2% — TETRACAINE HCl .15% with Phenylephrine HCl 1:2500
- PROCAINE HCl 4% with Epinephrine 1:65,000
- PROCAINE HCl 4% with Phenylephrine HCl 1:2500
- PROCAINE HCl 2% with Epinephrine 1:50,000
- PROCAINE HCl 2% with Phenylephrine HCl 1:2500
- PROCAINE HCl 2% with Epinephrine 1:25,000
- PROCAINE HCl 2% Plain

Graham Catalog #NS is a 4% solution of Procaine HCl with Neo-Synephrine HCl (1:2500) as the vasoconstrictor. It is ideal for use where patients show susceptibility to Epinephrine or in certain types of cardiovascular disease. As an added advantage, this solution can also be used without the fear of secondary hemorrhages, which sometimes result where high concentrations of Epinephrine are used.

Anesthesia is profound and lasts sufficiently long for most dental interventions, which makes *Graham NS* extremely valuable where a deep, short-acting anesthetic is required.

Graham cartridges are produced under ideal conditions in a new, streamlined laboratory. They are metal-capped to prevent leakage, and vacuum-packed to assure freshness. You will find them at leading dealers everywhere. For the one nearest you, or for literature describing Graham's 7 Anesthetics, write to

**Neo-Synephrine is the registered trademark of Winthrop-Stearns for its brand of Phenylephrine, as contained in this solution.*

Graham Chemical Co.
SPRINGFIELD GARDENS, N. Y.

A Good Alloy Need Not Be Expensive

Meets with A.D.A. Specifications — CHECK THESE PRICES

• Start now to use this tested, accepted alloy that has been used by leading West Coast Dentists for over 18 years. Speyer's Alloy is carefully made from C.P. metals. You will find it amalgamates smoothly, in minimum time, carves exceptionally well in ten minutes and produces a hard, well-sealed mass that polishes beautifully.

- 68½% silver.
- No initial contraction.
- 4.4 microns per Cm expansion in 24 hours.
- 1.6% flow 24 hours after amalgamation.
- Complete directions with every bottle.

A Star Performer in the Alloy Field

1 oz.	@	$1.90 per oz.
5 ozs.	@	1.70 per oz.
10 ozs.	@	1.60 per oz.
20 ozs.	@	1.50 per oz.
30 ozs.	@	1.40 per oz.
50 ozs.	@	1.30 per oz.

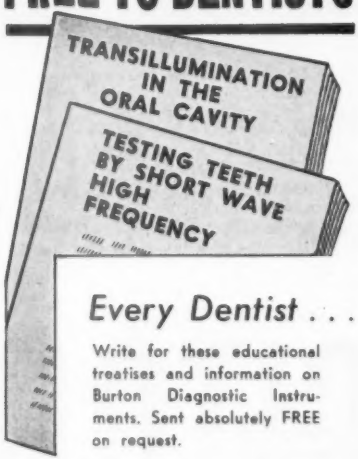
I enclose check for .....

If your dealer can't supply you, order direct.

SPEYER SMELTING & REFINING CO.
216 MEDICAL & DENTAL BUILDING
SEATTLE 1, WASH.

Dr. .....
Address .....
City ..... State .....

FREE TO DENTISTS



Every Dentist . . .

Write for these educational treatises and information on Burton Diagnostic Instruments. Sent absolutely FREE on request.

Send for yours today!

BURTON MANUFACTURING COMPANY
11201 W. Pico Blvd., Los Angeles 64, Calif.

Close-Up of Teeth Taken With Exakta "VX"

For Parallax-Free Dental Photography

New Model With Pre-Set Diaphragm

1952 EXAKTA—MODEL VX

35-mm. Single Lens Reflex Camera

For photographing conditions before and after treatment, cavities, inlays and bridgework, and for recording and for demonstrating oral treatment to patients. The indispensable aid of the progressive dentist! With f2.8 Zeiss Tessar "T" Coated Lens with Pre-Set Diaphragm Control $269.50
Penta Prism Eye Level Reflex Viewfinder 50.00
Extension Tube Set 24.00
Microscope Adapter 29.50

FREE—Write Dept. 300 For Free descriptive Booklet "C" on Camera & Accessories and Brochure On Close-Up Technique With Exakta.

EXAKTA CAMERA COMPANY
46 W. 29th St., New York 1, N. Y.

Exclusive Sales and Service Organization In U. S. A. For Ihagee Camera Works, Germany

Copyright 1951, Exakta Camera Company, Inc.

thanks

to the help

of your laboratory

you can serve many more patients!

In your city, as in every other city, laboratory service saves the dentist's time, extends the scope of his practice. It helps bring the benefits of modern dentistry to more men and women who are grateful for dentistry's progress. Among these benefits is *Lucitone* . . . the denture material perfected by Caulk to meet every requirement of up-to-date prosthetics.

Lifelike appearance. Lucitone's mottled, translucent "tissue texture" permits a higher degree of individuality.

Strength. More than ample to withstand all normal shocks and stresses, in both full and partial dentures.

Lasting fit. Lucitone's dimensional stability is always dependable.

Workability. Free from all technic restraints that may lead to inaccuracies in construction.

Lucitone is the trademark of the acrylic denture material manufactured exclusively for dentistry from Du Pont resins.

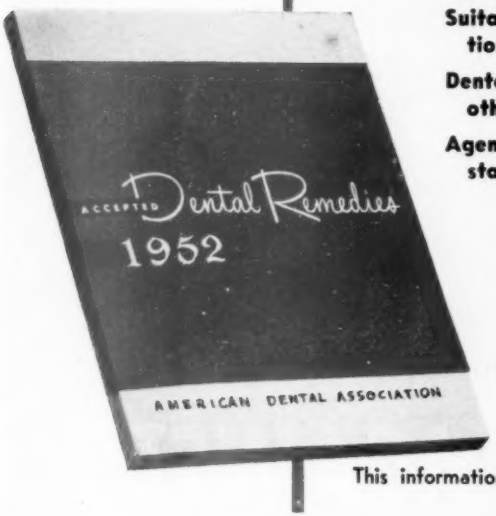
you're sure when you specify

LUCITONE

For progress in plastics talk to *Caulk* Milford, Delaware

THE 17TH EDITION . . .

ACCEPTED Dental Remedies



DO YOU KNOW:

Suitable conditions for disinfection of instruments?

Dental status of antibiotics and other anti-infectives?

Agencies responsible for drug standards?

Accepted commercial products?

Mechanics of prescription writing?

References to products not included in A.D.R.?

Provisions for acceptance of products?

This information appears in ACCEPTED DENTAL REMEDIES

Available NOW at only $1.50

ORDER DEPARTMENT, AMERICAN DENTAL ASSOCIATION
222 E. Superior St., Chicago 11, Illinois

Check the order you wish to place:

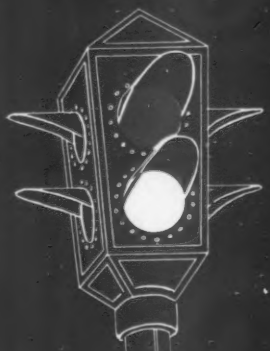
Place my name on the standing order list to get ACCEPTED DENTAL REMEDIES regularly each year beginning with the 1952 edition.

Just send me a copy of the 1952 book. My check for $1.50 is enclosed.

Signed .....

Address .....

..... City Zone State



SAFEST AGAINST BREAKAGE!

is cross-linked for extra strength and resistance to crazing . . . strain-controlled for dimensional stability and service. There's no finer denture material available. Are you acquainted with the *unrestricted* Densene Muco-Tec precision processing technic — ask your laboratory or write us for descriptive brochure.

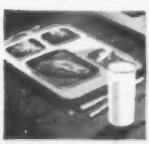
DENTAL PRODUCTS, INC · 219 EAST 44th STREET · NEW YORK CITY

DAIRY FOODS — essential to our nation's strength

To meet tomorrow's challenge

Research on teen-agers emphasizes the importance of an adequate calcium intake for growing young people.

One quart of milk daily during childhood—particularly when supplemented with vitamin D to insure maximum absorption and utilization of calcium—provides for ample storage of this mineral prior to the rapid growth period of adolescence.[1] The recommendation has been made that, during this period of accelerated growth, the daily milk intake of rapidly growing boys be increased to one and one-half quarts.[2] Not all of this needs to be in the form of fluid milk—cheese or ice cream may be substituted for equivalent amounts of milk as a rich source of calcium.



Boys and girls need ample supplies of *all* nutrients to meet demands for growth and activity. In addition to providing calcium for sturdy bones, milk supplies high-quality protein for growth of muscles and other tissues. In amounts recommended, dairy foods—milk, butter, cheese, ice cream—also make substantial contributions to the energy value of the diet, and to the supplies of riboflavin, vitamin A, thiamine, phosphorus, magnesium, and other essential nutrients.

Milk and milk products, as parts of an adequate diet for our youngsters, represent an investment in good health, strength, and morale for our country.

1. Stearns, G. Human requirements of calcium, phosphorus, magnesium. J. Am. Med. Assn. *142*:478 (Feb.) 1950.
2. Smith, J. M. Calcium needs of teen-age boys. Nutrition News, (April), 1947.

The presence of this seal indicates that all nutrition statements in this advertisement have been found acceptable by the Council on Foods and Nutrition of the American Medical Association.

ACCEPTED COUNCIL ON FOODS AND NUTRITION AMERICAN MEDICAL ASSOCIATION

National DAIRY COUNCIL

111 N. Canal Street, Chicago 6, Illinois

Since 1915 . . . the National Dairy Council, a non-profit organization, has been devoted to nutrition research and education to extend the use of dairy products.

It is obvious, of course, that a partial can't be more *accurate* than the impression from which it is made. Hence, the importance of taking an *accurate* impression can't be overemphasized because in a partial, the thing that means most to the patient is *accurate fit.*

It is also obvious that you can't take an accurate impression unless you use a material that has the proper consistency to conform closely to *all* the contours of teeth and tissue, and can be withdrawn in one piece without distortion.

Fortunately, there is such a material available. It's a true reversible hydrocolloid that flows freely yet is easy to control. It has a pleasant flavor and causes no discomfort. It is regarded by many dentists as the "ideal impression material" and more and more are using it all the time. We suggest you try it. Your dealer can supply you. Ask him for

DEELASTIC

DEELASTIC is supplied in convenient metal tubes. Also in small cartridges for indirect inlay technic.

PRECIOUS METALS • DENTAL SPECIALTIES • REFINING • DEE GOLD

HANDY & HARMAN

DEE PRODUCTS GENERAL OFFICES & PLANT
IVER W. KIMBALL STREET • CHICAGO 22, ILL.

INDEX TO ADVERTISEMENTS

January 1952

Abbott Laboratories A-4
American Dental Association A-8, A-16, A-17, A-53, A-57
Ash, Claudius And Sons A-52
Astra Pharmaceutical Products, Inc. A-34
Austenal Laboratories A-40, A-41

Bristol Myers Co. A-7, A-43
Burton Manufacturing Co. A-55
Butler Co., John O. A-51

Castle Co., Wilmot, ... A-10
Caulk Company, L. D. A-31, A-56
Childs Manufacturing Co. A-2
Church and Dwight A-27
Classified Advertising A-18, A-19, A-20
Coe Laboratories A-35
Columbia Dentoform Corp. A-20
Columbus Dental Mfg. Co. A-22
Colwell Publishing Company A-24
Cook-Waite Laboratories A-12, A-13
Corega Chemical Company A-44
Cosmos Dental Products, Inc. A-58
Crescent Dental Mfg. Co. A-8

Dental Perfection Co. A-42
Densco, Inc. A-9
Dentists' Supply Co. of N. Y. ..... 2nd Cover, 4th Cover

Exakta Camera Co. A-55

Getz Corp., William A-46
Graham Chemical Co. A-54

Hanau Engineering Co., Inc. A-36
Handy & Harman A-60

Jelenko and Co., J. F. A-45
Jelinek Dental Alloys A-15
Justi and Son, H. D. A-37

Kerr Mfg. Co. A-39
King's Specialty Co. A-24

Lauer Metal Shop A-30
Lea & Febiger A-15
Luxene, Inc. A-5

Medical Protective Co. A-15
Merck and Company A-50
Mosby Co., C. V. A-6
Moyer Co., J. Bird A-38

National Dairy Council A-59
Novocol Chemical Company A-26

Oral B Company A-23

Physicians Casualty & Health Assn. A-30
Pfingst & Company A-29
Professional Budget Plan A-3
Professional Printing Co. A-28

Reserve Plan, Inc. A-21
Ritter Company A-47

Speyer Smelting & Refining Co. A-55

Toledo Dental Products Co. A-14
Ticonium A-25
Toothmaster Company A-24

Union Broach Company A-30
U. S. Savings Bonds A-1

Wernet Dental Mfg. Co. A-32, A-33
White Dental Mfg. Co., The S. S. A-48, A-49

Year Book Publishers, The A-11

you can't make a BIG horse out of a small pony

and experience and observation have shown that when teeth are, for purposes of sizing, reduced or enlarged, they lose much of the vitality that is characteristic of fine natural teeth in their original size.

•

Contrary to the conventional system of sizing teeth, the small forms of **Trubyte Bioform Teeth** are not simply the reductions or enlargements of other forms.

NEW IN EVERY WAY

trubyte Bioform® teeth

the first "vacuum fired porcelain" teeth

Each form is a reproduction of six natural anteriors that have been selected for their size and proportions, appropriate outline and pleasing labial characteristics.

•

It is not easy for the most careful observer to distinguish the finest natural teeth from Trubyte Bioform Teeth.